The Huxley Lecture

ON

HEREDITARY ASPECTS OF NERVOUS AND MENTAL DISEASES.

BY

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Mr. Chairman,—Permit me to thank you and my colleagues of Charing Cross Hospital Medical School most heartily and cordially for the great honour conferred upon me by the request to deliver the Huxley Lecture this year. When I look back on my distinguished predecessors I feel that, with this honour, there is a great responsibility, for it is not an easy task for me to deliver a lecture worthy of the occasion; I felt, therefore, some difficulty in the selection of a subject. I was, however, guided in my selection of the hereditary aspect of nervous and mental diseases by the following facts. Heredity is the subject that the master mind of Huxley illuminated in several of his essays, and it is fundamental in the study of the origin of species and natural selection, which he did so much to forward. Next, recent developments in our knowledge of the subject of heredity, owing to the labours of Galton, Pearson, and their followers in the study of biometrics, and Bateson and his followers in Mendelism, have aroused the keenest interest in the subject of human inheritance, not only in the medical profession, but in the thinking and intellectual portion of the nation. Another reason was that none of the illustrious lecturers in the past have dealt with the subject of heredity in relation to disease. Lastly, it is a subject to which I have recently devoted a large amount of attention in the study of the causation of nervous and mental diseases, and more especially the relation of heredity to various forms of insanity. The wealth of material in the London County Asylums has permitted a biometric investigation in a novel manner. The subject is one of national importance and interest, and it affects many social and legislative questions. The interest taken by the general public in the question of heredity is a sign of social progress. People are recognizing the truth of Thomson's saying, "The present is the child of the past; our start in life is no haphazard affair, but is vigorously determined by our parentage and ancestry; all kinds of inborn characteristics may be transmitted from generation to generation."

Fifty years have elapsed since Huxley wrote an essay on the Origin of Species in the *Westminster Review*, and the doctrine of natural selection which he upheld with such remarkable force remains unshaken and unshakable, but mutations or discontinuous variation has replaced in great measure the continuous accumulation of small differences to which Darwin attributed so much importance in evolution; and it is interesting to note that Huxley in this same essay said, "Mr. Darwin's position might, we think, have been even stronger than it is if he had not embarrassed himself with the aphorism, *Natura non facit saltum*, which turns up so often in its pages." We believe that Nature does make jumps now and then, and a recognition of the fact is of no small importance in disposing of many minor objections to the doctrine of transmission. Huxley cites the case of the Ancon sheep, also an interesting pedigree of polydactylism narrated by Réaumur. I will show a diagram (Fig. 1) illustrating this condition in three generations. Réaumur narrates this case only as far as the third generation, and Huxley remarks:

> Certainly it would have been a curious thing if we could have traced this matter any further. Had the cousins intermarried a six-fingered variety of the human race might have been set up.

In the light of the Mendelian law of gametic segregation even this would not be necessary, for a variation is "not swamped out." But sexual selection would tend against the perpetuation of this variation, which does not serve a useful purpose nor is it an ornament. Huxley, in another essay on Hereditary Transmission and Variation, refers to the different product of crossing a stallion with a she-ass and a male donkey with a mare. "Here, you see, is a most curious thing. You take exactly the same elements, the ass, and horse, but you combine the sexes in a different manner, and the result is modified accordingly. Here, then, is one, and perhaps a necessary, cause of variation." There is in these instances a prepotency of the male in certain physical characters; for, on the one hand, when the donkey is the sire, a mule is produced with the head, ears, and voice resembling that animal; when, on the other hand, the horse is the sire, a hinny is the product, with head, ears, legs, and voice like the horse.

Again quoting Huxley:

> A certain amount of variation is the necessary result of sexual propagation itself: for inasmuch as the thing propagated proceeds from two organisms of different sexes and temperaments, and as the offspring has to be either of the one sex or the other, it is quite clear it cannot be a diagonal of the two or it would be no sex at all; it cannot be an exact intermediate form between that of each of its parents; it must deviate either to one side or the other. You will have noticed how very often it may happen that the son shall exhibit the maternal type of character, or the daughter possess the characteristics of the father's family.

The law of ancestral heredity of Galton supposes that every ancestor of a particular individual contributed its quota to the heritable qualities of the individual. The law also states that the average amount of resemblance between an individual and any particular ancestor is capable of definite numerical expression. Thus the mean

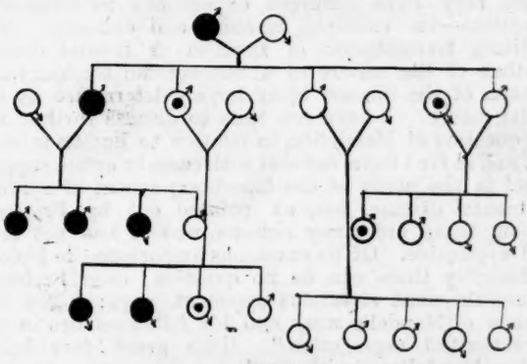

Fig. 1.—Polydactylism. The black figures indicate complete polydactylism; the circles normal; the circles with black centre partial polydactylism.

amount of correlation between (1) the two parents and the offspring, (2) the four grandparents and that offspring, (3) the great-grandparents and that offspring, and so on, backwards in the ancestral lineage, is believed to diminish in a geometrical series one half, one quarter, one eighth, which is the same for all organisms and their characters. Pearson represents as more rapidly diminishing series (1) for the two parents 0.6244, for the grandparents 0.1988, for the great-grandparents 0.0630, etc. We thus have a mosaic of ancestral characters.

It is quite possible that the above represents correctly the average total contributions of ancestors when applied to the race as a whole, but it cannot be universally applied to individuals, for according to Mendel's theory of inheritance certain ancestors may contribute nothing to the constitution of certain offspring in respect to certain characters. Moreover, as Maudsley truly says:

> It is a conclusion which, however true on the average of such simple characters as height, is manifestly not true of individual cases. Any one selecting for observation different characters, e.g., noses or ears, can see plainly the nose may be like the father's or the mother's or perhaps one of the grandparent's or further back.

This fact was well known to the ancients, and, according to modern ideas of heredity, there is not much to be said against the teaching of Lucretius:

> Sometimes too the children may spring up like the grandfathers, and often resemble the forms of their grandfather's fathers, *because the parents often keep concealed in their bodies many first beginnings mixed in many ways, which first proceeding from the original stock*, one father hands down to the next father, and then proceeding from these, Venus produces forms after a manifold chance, and repeats not only the features but the voice and hair of forefathers; and the female sex equally springs from the father's seed and males go forth equally from the mother's

body; since these distinctions no more proceed from the fixed seed of one or other parent, than our face and bodies and limbs. Again we perceive that the mind is begotten along with the body and grows up together with it and grows old along with it.

The individuality of every human being depends upon the mingled natures of two separate parents, and Goethe poetically refers to his own hereditary endowments in the following lines:

Vom Vater hab ich die Statur,
Des Lebens ernstes Führen,
Vom Mütterchen die Frohnatur
Und Lust zu fabulieren.

According to the Mendelian doctrine of dominant and recessive, the corresponding character of the second parent always exists in the offspring side by side with the character which finds expression, only the former, termed "recessive," is obscured by the latter, the "dominant." This is the explanation of a characteristic feature of a particular grandparent which was not visible in the parent reappearing in the child (see Fig. 1). It also accounts for those heritable diseases and abnormalities which are transmitted by the females in ancestry and appear in the males—for example, haemophilia, Daltonism, pseudo-hypertrophic paralysis. As it passes from a father through a daughter to a grandson, and so on, it must be latent in the germ cells (concealed in the body), though for some obscure reason it has not found expression. In fact, non-expression of a disease does not necessarily imply non-inheritance of a disease, rather a predisposition to disease.

It is well known that a hereditary tendency to nervous disease may have different expressions in successive generations—for example, insanity and epilepsy. The hereditary transmission of nervous or mental disease is rather of the nature of a neuropathic tendency, the character of the disease being largely determined by the exciting cause. I have not time to discuss further the large question of Mendelism in relation to human inheritance, and so far I have not met with cases in entire support thereof in the study of the hereditary aspect of nervous and mental disease, but, as pointed out by Professor Bateson, there are many reasons why it has not been found applicable. Of its enormous importance to biology and heredity there can be no question; even Professor Pearson, its most strenuous opponent, says: "The importance of Mendel's work and his followers lies in the observation of segregation." This great fact holds, whether Mendelism in its simple form remains or not.

The Rarer Nervous Diseases and Heredity.

Among the rarer nervous diseases in which it is generally recognized that heredity plays an important part may be mentioned: Myotonia congenita, pseudo-hypertrophic paralysis, progressive muscular dystrophy, especially the Landouzy-Déjerine facio-scapular type, the neuritic type of progressive muscular atrophy, hereditary ataxia, Huntington's chorea, and family periodic paralysis.

In nearly all the recorded cases of myotonia congenita (Thomsen's disease) the disorder has existed in several relatives of the patient, generally in one of the parents and in the patient's brothers, sisters, and children. More than twenty cases of the kind occurred in the family of Dr. Thomsen in four generations. It is to him that we owe the first accurate description. As in Huntington's chorea (a remarkable pedigree of which I will show you) other neuroses frequently occur in the family tree. Many of Thomsen's relatives were affected mentally.

Sir William Gowers, in the discussion on heredity in relation to disease,* referred to the frequency with which pseudo-hypertrophic paralysis is hereditary; he likewise pointed out that the disease is characterized by sex-limitation—citing a very remarkable case. The disease, although not affecting the females, passed through to the males in several successive generations; there were two families, and probably both originated in the same stock. Again he referred to a remarkable case of facio-scapular humeral atrophy (Landouzy-Déjerine type), which could be traced for six generations.

Family periodic paralysis is a rare disease with a well-marked hereditary tendency; it is characterized by periodic attacks of more or less extensive flaccid motor paralysis with a loss of electrical excitability in the paralysed muscles and of the reflexes, but without sensory affection or disturbance of consciousness. Between the attacks the patient is well. In a family recorded by E. W. Taylor there were 11 cases in one generation; in the family of a patient of Goldflam there were 11 cases on the maternal side, and Holtzapple observed 17 cases in four generations. The disease may be transmitted indifferently through the father or the mother, although occasionally there has been limitation of transmission to the same sex. As in other diseases with a similar hereditary character, individua cases may occur in which there is no family history of the disease.

A remarkable case of neuritic progressive muscular atrophy, showing that it might be of an hereditary character, was reported by Herringham; the disease was transmitted by females, but only males were affected. The disease, however, may be transmitted by both males and females, and both sexes are affected.

Friedreich's disease, although called hereditary ataxia, is seldom directly hereditary; it is a familial disease. Several families and several isolated cases have come under my observation, but in the isolated cases no family history of the disease in ascendants was found, nor was it in the two cases affecting a number of members of the family; in one of these there was a history of consanguinity, the parents of this family of hereditary ataxia cases being first cousins. A remarkable pedigree of hereditary ataxia worked out by Sanger Brown, however, shows the disease occurring in five generations of a family. Gordon Holmes states that Schoenborn found a family incidence in 114 of the 200 cases he analysed. Yet in a not inconsiderable number of recorded cases the same disease occurred in the ascendants or in the collateral lines. It may be transmitted through either males or females. Occasionally there is not direct heredity, but the disease occurs in families in which there seems to be a proclivity to spinal disease; for instance, a pedigree which I obtained at Darenth Asylum showed this relationship. Moreover, occasionally, as this pedigree showed, it may be associated with idiocy. Nolan and Pritzsche have recorded cases associated with progressive idiocy. I will now pass on to the consideration of a disease which I have met with occasionally in the asylums—namely, Huntington's chorea — in which a direct heredity has been found practically in all the cases studied. The accompanying pedigree (Fig. 2) is a striking one, kindly furnished to me by Dr. Bond, of Long Grove Asylum, under whose care is the patient of the fourth generation. Huntington, who first gave a complete picture of the disease, remarks:

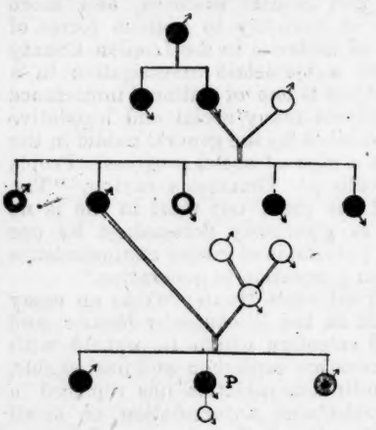

Fig. 2.—Huntington's chorea. Four generations. P is the patient insane and in Long Grove Asylum, suffering with chorea. The black figures indicate patients suffering with chorea; several died in asylums or in the infirmary. The black figure with white centre indicates nervous affection, but not chorea. The shaded figure with black centre indicates death at an early age of convulsions.

> If one or both of the parents have shown manifestations of a serious nature, one or more of the offspring almost invariably suffer from the disease if they live to adult life; but if by any chance these children get through life without it, the thread is broken, and the grandchildren or great-grandchildren may rest assured that they are free from the disease. Unstable and whimsical as the disease may be in other respects, in this it is firm; it never skips a generation to manifest itself in another; as soon as it has yielded its claims it never regains them.

Huntington also remarks upon the presence of the nervous temperament in all or nearly all of the families in which there is the taint of this disease, and says "that nervous excitement to a marked degree almost invariably attends upon every disease these persons may suffer from, although

* *Proceedings of the Royal Society of Medicine.*

they may not in health be over-nervous." Heilbronner states that there is a tendency in successive generations for the onset of the disease to be delayed, and Wollenberg has shown—as this pedigree very clearly indicates—that choreic heredity in some cases may be transformed into other neuroses, such as epilepsy, imbecility, paranoia, grave hysteria, etc. This disease is more common in men than women, and Wollenberg's collected statistics of 128 cases in 22 families showed a proportion of 74 men to 54 women. Isolated cases of Huntington's chorea occur in the asylums, and it has been observed that the tendency to insanity, and sometimes that form of insanity which leads to suicide, is marked.

In several cases microscopic examination revealed a marked neuronic atrophy, with some neuroglia hyperplasia of both the frontal lobes, including also the central convolutions. Changes in the Betz cells have been described; these changes, no doubt, would be sufficient to account for the motor disorder manifested during life.

The forms of nervous disease I have briefly described are usually due to characteristic morphological defects, and for the most part are best explained by germinal defects in the specific vitality of groups of muscles or systems of neurones, whereby they waste prematurely. Sir William Gowers has introduced the term "abiotrophy" for this condition. From a practical point of view, on account of their rarity, abiotrophics are of little importance as compared with insanity and epilepsy, to which I shall now direct your attention.

Epilepsy and Heredity.

With regard to epilepsy, I feel convinced from my own observation and experience that Sir William Gowers is correct when he asserts that there are few diseases in the production of which inheritance has a more marked influence, and the traceable influence is always far less than that which exists. Voisin, Feré, Nothnagel, Dana, Peterson, and Aldren Turner express similar opinions.

In the discussion of the subject of heredity and disease, Sir William Gowers said: "In my own inquiries into the heredity of epilepsy I have limited myself to these two maladies, epilepsy and insanity. Heredity was ascertained in 39 per cent. of 1,193 males and 43 per cent. of 1,207 males. When epilepsy itself occurred in a parent, it was the father who was epileptic in 49 per cent. and the mother in 51 per cent. The cases with insanity in a parent are only one-third the number compared with parental epilepsy. Of the cases with parental insanity the father was insane in 37 per cent. and the mother in 63 per cent. One effect of heredity is to increase the female cases. When it was absent the excess of males amounted to 4 per cent., but in cases of heredity the same excess was presented by females. This is partly due to the fact that inheritance is more frequently from the mother's side by 17 per cent., and that females are in excess by 18 per cent." These facts (obtained by Sir William Gowers) are in many ways in striking conformity with the results obtained by my investigation of insane relatives in the London County Asylums as regards certain types of insanity which I shall shortly relate. Moreover, I have observed that a similar heredity occurs in a considerable number of cases of insane epileptics. Spratling, from his large experience at Craig Colony, gives 16 per cent. of similar heredity.

Heredity and Insanity.

There are a few alienist physicians who do not have a strong belief in the hereditary causation of insanity, and my esteemed colleague, Dr. Mercier, at the discussion on heredity, said: "When we are confronted with the percentage of persons among whose near relatives insanity is known to exist, we cannot fail to be impressed with two remarkable facts—first, how relatively small their percentage is, and, secondly, that the statistics, even if taken at their face value, do not purport to be anything but an *enumeratio simplex*, and cannot be made the basis of any valid conclusion until they are compared with similar statistics of the percentage of insane relatives among the sane." He also stated that the published statistics are of no value at all, for any practical or scientific purpose. With this I would entirely agree, but in taking statistics among the same population we should find that insanity and epilepsy would often occur in families where there were neuroses, eccentricity, and even genius, all of which are variations from the normal average of the species. I have endeavoured to ascertain what is the proportion of insane, feeble-minded, and epileptic members occurring in the pedigrees of my hospital patients; and I am greatly indebted to my house physician, Dr. Thomas, for the careful and painstaking way in which he has obtained information from the friends. In 32 pedigrees, which would include about 1,000 living representatives and 250 dead individuals, there were 8 who had been in asylums, and in 8 others fits were chronicled. In no case was either parent of the patient insane or epileptic. Two of the pedigrees furnished most of the cases. One was a patient suffering from neurasthenia, in which there were, besides insanity and epilepsy, migraine, hysteria, deaf-mutism, and imbecility, and the other a patient with exophthalmic goitre with several neuropathic members in the stock (Fig. 3). I must confess that, had I to prove my

1. Insane or epileptic.
2. Physically unsound.
3. Suicidal.
4. Healthy.
5. Nervous disease.
6. Brilliant talents.
7. Died young.
8. Drunkard.
9. Drunkard and insane.

Key to all figures except Figs. 1 and 2.

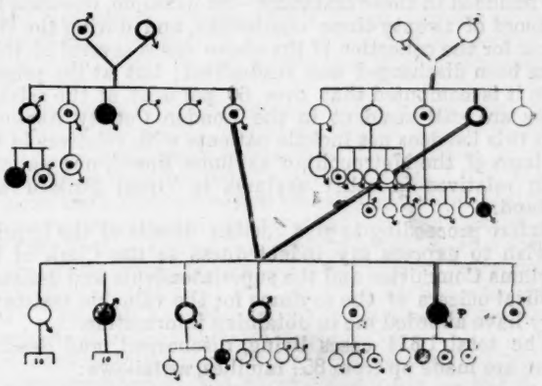

Fig. 3.—The pedigree of a neuropathic patient, P., suffering with neurasthenia and slight mental symptoms. It will be observed that she comes from neuropathic stocks on both sides, maternal and paternal.

case by comparing the pedigrees thus obtained with some pedigrees obtained at the London County Asylums and Imbecile Asylum at Leavesden [25 non-selected pedigrees were kindly taken for me by Dr. Elkins and his medical officers], I should not have a very strong case; for in a very considerable proportion of the cases admitted to these asylums interrogation of the friends elicits no evidence of insanity on either side. Yet most alienist physicians would not agree with Dr. Mercier in casting doubt upon the importance of heredity in the production of insanity. I would rather say certain types of insanity. Many of the inmates of asylums are suffering with congenital or post-natal organic brain disease; these conditions are certainly not due to inheritance. General paralysis of the insane, syphilitic brain disease, and softening from vascular disease are acquired conditions and should not be classed among the inherited insanities, nor should Korsakoff's psychosis and chronic alcoholism. In all attempts, however, to ascertain what forms of insanity are especially due to inheritance there is always the difficulty of finding out by inquiry of the friends what *was* the nature of the insanity, not only because the friends do not know, but also because different opinions may be held by the medical men who have had charge of the cases and different systems of classification and terminology have been used. Therefore any statistical inquiry formed upon pedigrees the data of which are based *solely* upon information which has been obtained of friends of the patient may have several radical faults. The lack of statistical evidence of heredity in relation to

feeble-mindedness was noticed by Sir Francis Galton in his comments upon the Report of the Commission on the Feeble-minded, and yet the opinion of experts was unanimous in favour of the importance of heredity as a causal factor.

Two years ago an experienced biometrician and scientist, Mr. Edgar Schuster, kindly undertook to co-operate with me in the study of the convolutional pattern of the brains of relatives dying in the asylums, with a view of seeing whether there is a similarity in the convolutional pattern in the members of the same family, just as there is a similarity of physiognomy. An inquiry was initiated concerning relatives at the various asylums, and a request was made that brains of relatives should be kept for examination after the autopsies had been made. Isolated instances of two or more members of the same family were known to exist by me in the various asylums; but it soon became evident that a properly co-ordinated card system would reveal the fact that a *very large number* of parents and offspring and brothers and sisters, besides collateral relatives, were resident in the London County Asylums, or had been recently. In June the numbers had risen from a few hundred known instances to 1,834 (763 males, and 1,071 females); and since then, owing to a newly opened asylum not having furnished full reports, and owing to the fact that fresh cases are continually turning up at other asylums, the numbers have now reached 2,000. These instances have been afforded by the records of patients under observation during the last two years, and include their relatives who have died in, or who have been discharged from, the London County Asylums previously. A large number of cases of recurrent insanity are included in these instances—for example, one case has a record of twenty-three admissions, and during the time taken for the collection of the above cases several of them have been discharged and readmitted; but at the present time it is computed that over 60 per cent. of the relative cases are still resident in the London County Asylums. And this list does not include patients with relatives in the asylums of the Metropolitan Asylums Board, nor patients with relatives in other asylums in Great Britain and Ireland.

Before proceeding to give further details of the inquiry, I wish to express my indebtedness to the Clerk of the Asylums Committee and the superintendents and assistant medical officers of the asylums for the valuable assistance they have afforded me in obtaining information.

The total 1,834 cases living, discharged, and dead in June are made up from 854 families, as follows:

2	instances of	6	of a family.
3	,,	5	,,
12	,,	4	,,
85	,,	3	,,
752	,,	2	,,

Of the 752 instances of two of a family, making in all 1,504 cases, it will be observed that the vast majority are directly and not collaterally related. Another fact stands out prominently in an analysis of the 752 instances of two of a family, and that is, the much greater incidence of transmission from parents to offspring through the female side, as the following figures show:

Parental Heredity.

	Instances.	Males.	Females.
Father and son	44	88	—
Mother and son	51	51	51
Father and daughter	58	58	58
Mother and daughter	104	—	208
	297	197	317

It will be observed that the mother transmits to the offspring in the proportion of 60.7 per cent., the father 39.3 per cent. This is not accounted for wholly by the fact that there are more females in the asylums insane than males, for the ratio of females to males in the asylums is rather less than 11 to 9. Sir William Gowers, in his statistics regarding insanity in the parents and epilepsy in the offspring, observed that in cases with parental insanity the father was insane in 37 per cent, and the mother in 63 per cent. This, he says, is partly due to the fact that inheritance is more frequently from the mother's side by 17 per cent., and that the females are in excess by 18 per cent. It will be observed that these figures of mine *closely* correspond with his on the transmission of insanity from mother and father to offspring.

Co-fraternal Heredity in Two of a Family.

	Instances.	Males.	Females.
Two sisters	130	—	260
Two brothers	87	174	—
Brother and sister	136	136	136
		310	396

The above table shows when pairs of offspring of the two sexes are affected, the proportion of males to females is 43.9 per cent. to 56.1 per cent., a difference of 12 2 per cent. But the percentage in which the mother transmits insanity to the offspring as compared with the father is as 67.7 per cent. to 39.3 per cent., a difference of 26.4 per cent., and this increase of 14.2 per cent. is mainly due to the fact that she transmits to the daughter nearly twice as often as the father does. It may well be asked whether this may not partly be due to the fact that the daughter, at the time of life when insanity is manifested, is more at home than the son, and therefore has more to do with her insane mother.

Grandparents' Heredity.

Female with insane grandfather	...	1	instance.
Male ,, ,, ,,	...	1	,,
Females with insane grandmother	...	6	instances.
Males ,, ,, ,,	...	5	,,

This is undoubtedly very much below the proper ratio; it is due to the fact that there is far more difficulty in obtaining records. The hereditary transmission from females, however, markedly preponderates.

Collateral Insanity.

	Instances.		Instances.
Female with uncle ...	12	Male with uncle ...	11
Female with aunt ...	33	Male with aunt ...	11
	45		22

There is here a more marked preponderance of females affected than males than in direct heredity, but the numbers are too few to draw any very decided conclusions, except the fact that the females with aunt affected are as numerous as all the rest combined.

The proportion of collateral relatives discovered in the London County Asylums is comparatively small for several reasons; the information is not so readily obtainable, and they are less likely to come into the same asylum as their residence is not nearly so likely to be in the same district as that of parent and offspring.

I have analysed the above figures, only taking into account near blood relations (parents and offspring, brothers, sisters, or brothers and sisters), where two or more representatives of the family *are now* resident in the London County asylums. The following figures show that of an average insane population of approximately 20,000, 717 cases are thus related, representing 342 families. We may ask the question, Should we find in 20,000 adults, living in the county of London, which some random non-inheritable cause had collected together, this proportion of direct relationship? I think not.

The figures, to my mind, are in a broad way eloquent in favour of the importance of heredity as a cause of insanity; and the numbers being great, the data indisputable facts, independent of the personal equation of the inquirer, enable satisfactory statistics to be made and inferences to be drawn in regard to certain points relating to the hereditary aspects of mental disease.

Analysis of Instances where Two of a Family (Near Blood Relations) are now Resident in the London County Asylums.

Father and son	34
Father and daughter	58
Mother and son	44
Mother and daughter	102
Two sisters	144
Two brothers	80
Brother and sister	160
	622

Total, 622 cases, representing 311 families.

In addition to the above there are 95 cases in which *three* (and in two instances four) members of the same family *are now* insane residents in the London County asylums—31 families.

Grand total, 717 cases, representing 342 families.

A mother, two daughters and a son have been sent to an asylum since this table was compiled.

When taking part in the discussion at the Royal Society of Medicine on heredity and disease, I expressed the opinion that, without being then able to give any precise data, the investigation I was conducting had led me to conclude that we should find among these relatives in the asylums certain types of insanity exhibiting a more marked tendency to inheritance than others, and I enumerated recurrent or manic depressive insanity, delusional insanity and the insanity of adolescence (dementia praecox) and imbecility as having this tendency most marked. Moreover, I observed that cases of general paralysis were relatively few in number. In the light of modern views as regards the causation of general paralysis being due to syphilitic infection I was not surprised to find my inference was correct. Again, in the evidence which I gave before the Royal Commission on the Feeble-minded I pointed out that during the eight years ending December 31st, 1902, there were 8,933 patients discharged from the London County Asylums as recovered, the percentage of readmissions was 25.59, and one-half of these cases were readmitted within twelve months of their discharge. The clinical records showed that a considerable number of these readmissions were cases of recurrent insanity termed "recurrent mania" and "recurrent melancholia"; the more modern term for this periodic insanity is "manic depressive insanity." But whatever term it is called there is one feature, namely, periodicity. When I inquired into the family histories of these cases, I found insanity in other members of the family in 55 per cent., even though I did not eliminate those cases which were not visited by friends, and there was no record regarding inheritance; moreover, I found particulars of many relatives of patients being in the asylum at the time or who had previously been in there or died there. These observations were made at Colney Hatch Asylum, where the Superintendent, Dr. W. J. Seward, had for a long time been in the habit of taking the history himself from the friends who visited. I may add that this asylum has afforded valuable information in this research, partly because it is an old asylum, with records often of three generations, and partly because, containing, as it does, all the Jews, one has the opportunity of comparing the incidence of inheritance of this race with the non-Jewish population. I am indebted to Dr. Seward for the following statistics relating to the percentage of relatives among the Jewish and non-Jewish population: The number of cards belonging to Jews is 80; the number belonging to non-Jewish inmates is 254. The total number of inmates is 2,450, and of these 459 are Jews, so that rather less than one-fifth of the total population is Jewish. A little more than one-fourth of the relative cards belong to Jews, so that the incidence of ascertained relationship among the Jewish inmates is considerably more than among the non-Jewish. No doubt the temperament of the Jews renders them, as a race, more liable to the neuropathic tendency, but the greater incidence of ascertained relationship among the Jews is partly due to the following facts: They are more often visited by their friends; they have more pride of family, know more about their family, and, as a general rule, are more intelligent and anxious to afford information.

Statistics are often distrusted when an inquirer sets out to find something. I was, therefore, fortunate in having the co-operation of such an unbiassed statistician, skilled in biometrics, like Mr. Edgar Schuster. The cards were all sent to him for an independent and unbiassed investigation. His valuable report is published in the forthcoming annual report of the Asylums Committee. But I will summarize his results in great part in his own words:

There were 319 pairs of parents and children; of these, the children in 69 cases suffered from periodic insanity. Of the 69 so afflicted, 28, or 40·6 per cent., had parents similarly affected, while in 59·4 per cent. the nature of the parents' disease was different. Of the remaining 250 children, only 41, or 16·4 per cent., had parents suffering from periodic insanity. Bratz, working at Wuhlgarten Asylum, Berlin, on similar lines, has obtained similar results, but as yet has not published any statistics. He speaks of this similarity of insane inheritance as a *Vererbungskreis*.

There was even greater similarity of insane inheritance between brother and brother, between sister and sister, or between brother and sister when suffering from this form of insanity than between father and mother and son and daughter. Thus there were 200 pairs in which the first brother or sister was periodically insane, and in 92, or 46 per cent., of these pairs the second member also suffered with manic-depressive insanity, while in the remaining 108, or 54 per cent., the two members differed in the nature of their disease.

Where the first brother and sister suffered from some other form of insanity, in only 13.8 per cent., as compared with 46 per cent., was the other member afflicted with periodic insanity, while in 86.2 per cent. were other forms associated together. This indicates similar cofraternal inheritance more than three times as frequent in recurrent insanity as in other forms. Allowing that the term "recurrent" may have been used sometimes for a second attack of mania or melancholia which was not truly a manic depressive insanity—still it would not account for this vast difference when dealing with such a number of cases.

Delusional Insanity.—Although the numbers dealt with are many fewer, yet Mr. Schuster's statistics show that the tendency of this disease to run in families is more strongly marked than between parents and offspring. The tables he gives show that delusional insanity occurs with almost four times as great a frequency (33.3 per cent. instead of 9 per cent.) than among the insane parents of other insane people, while among the brothers and sisters the frequency is just six times as great (43.2 per cent. instead of 7.2 per cent.). There is a decided tendency for the brothers and sisters of imbeciles to be also imbecile.

In dementia praecox there is a strong correlation between members of the same cofraternity (*vide* Fig. 5); seeing, however, that quite 80 per cent. of the cases of this form of insanity occur before the age of 25, it is not surprising to find Schuster "had no available material for statistics on parents and offspring." Perhaps the term "insanity of adolescence" is a better one than "dementia praecox." The report also shows a strong correlation between brothers and sisters when affected with chronic mania or melancholia, but the numbers are perhaps too small to draw any very definite conclusions.

With regard to general paralysis, he found no indication of this disease running in families. The brothers and sisters of general paralytics seem no more likely than anybody else to be themselves general paralytics, and the same may be said about their children. Of the very few cases of juvenile general paralysis recorded, only one is the son of a general paralytic.

The second problem enunciated was, "Is there any tendency for members of the same family (as in some hereditary nervous diseases) to become insane at similar periods of their lives?" Seeing that adolescence is the period in which stress is likely to affect the individual with an insane inheritance, it is not surprising that Schuster in his report states that "a strong tendency exists for brothers and sisters of the same family to become insane at similar periods in their lives, and only a slight one between parents and children."

Since certain forms of insanity exhibit a much greater tendency to similarity of type in parents and offspring and brothers and sisters, it may be concluded that *these are the types* in which an inheritance of a tendency to insanity is three or four times as great as in other forms. Now we may ask ourselves the question: "Is there any correlation between the macroscopic and microscopic appearances of brains of persons suffering from manic

depressive insanity, delusional insanity, epilepsy, and insanity of adolescence where there is no terminal dementia?"

It would be difficult in the vast majority of cases to discover any abnormal morphological change, nor would microscopic investigation afford much (if any) help in the elucidation of these psychoses. Indeed, I know of only one form of insanity that is really (as I have already said), an acquired organic disease, namely, general paralysis, which, on macroscopic and microscopic investigation of the brain *post mortem*, shows such change in the organ of mind as to justify a diagnosis of the form of insanity which had affected the individual during life. I do not mean to say that these psychoses may not eventuate in a dementia, and then changes may be found in the brain.

There is a disease affecting Jewish infants which is quite specific in the changes observed in the brain and nervous system; I refer to so-called "Amaurotic Idiocy," four cases of which I have investigated. Why it should affect only Jewish children, and occasionally occur in several members of the same family, is not known; nor is it explicable unless it be by an abiotrophy due to some racial hereditary condition. This disease shows a pathological change quite unlike any other disease of the nervous system that I have seen; the Nissl substance disappears from without inwards towards the nucleus, and eventually the nucleus itself dies and the whole cell undergoes a true fatty degeneration; the neurones which were the last developed are the first to go—thus the pyramidal layer of the cerebral cortex shows this fatty degeneration much more markedly than the subcortical neurones.

PEDIGREES ILLUSTRATING INSANE INHERITANCE.

Every insane patient should be considered as a biological study. To say, merely, that one of his ancestors was

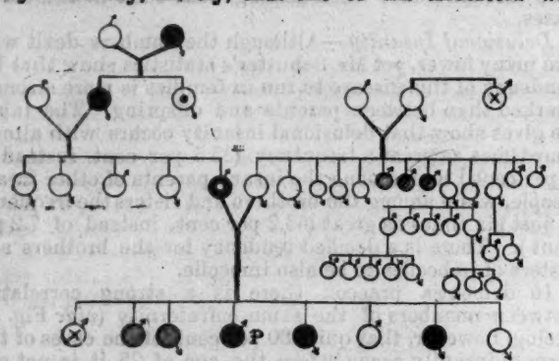

Fig. 4.—The pedigree of an insane family with homicide and suicide. The patient, P., was insane and committed a murder; a brother committed suicide; two sisters were insane. The insane inheritance was obviously from the maternal side.

insane, and therefore he has a bad heredity, and to label him thus, as is the common custom, is absurd. What we wish to know is what he was born with, and what has happened to him since birth. I have found that a conversation with the mother will very much help in understanding the causes which have led up to the mental breakdown, and she is often able, and generally very willing, to tell all she knows about the family. I am speaking only of the poorer classes.

The causes of insanity are seldom simple; they are in varied degrees inborn tendencies combined with some form of mental or bodily stress. I use the word "stress" in its widest sense as implying a strain on the important organs and functions of the body. But it is not within the province of this lecture to deal with these causes of insanity, for my object is to dwell upon the elucidation of what were probably the inborn tendencies. The construction of a pedigree will often answer the question, Did the patient come from a good stock on both sides, or was there physical or mental defect, or both, on maternal or paternal or on both sides? The fact that a cousin was insane, or even several members of a large stock, does not show a bad heredity; often, indeed, with several insane members there will be found men of genius and men and women of great civic worth (Fig. 6). A bad stock is where we find degeneracy, insanity, drunkenness, and criminality in the pedigree (Fig. 4), or a general low standard, mental and physical, in both stem and branches of the family tree. The general tendency is for insanity not to proceed beyond three generations, and I have only three such records. As a rule, there is either a regression to the normal or the stock dies out (Fig. 4). Not infrequently the stock dies out by the inborn tendency to insanity manifesting itself in the form of congenital imbecility or insanity of adolescence—dementia praecox. Such patients are especially prone to die of tuberculosis. Thus rotten twigs are continually breaking off the tree of life, and I will now illustrate these facts by some examples of pedigrees (*vide* Fig. 5).

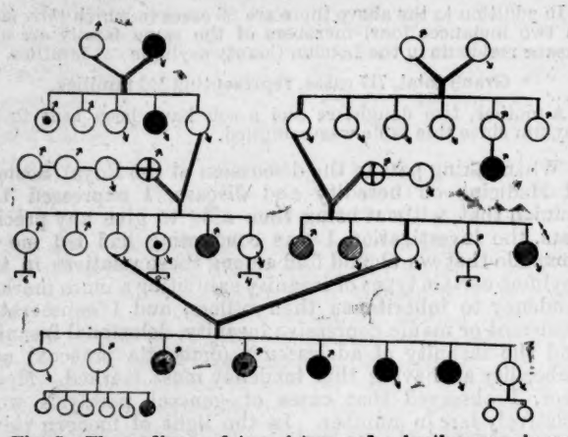

Fig. 5.—The pedigree of two sisters and a brother now in an asylum suffering with dementia praecox. It will be observed that two other members of the same generation have healthy children. Both the parents were sane, total abstainers, but there is abundant evidence of insanity in collaterals on both sides.

Consanguinity does not appear to produce insanity or nervous disease provided both stocks are free from taint; but if there is insanity or epilepsy (not necessarily in the first ascendants, but even in the collaterals), then intermarriage of first cousins from these two stocks with collateral insanity will tend to insanity or epilepsy in some cases in the offspring of the two sane related parents.

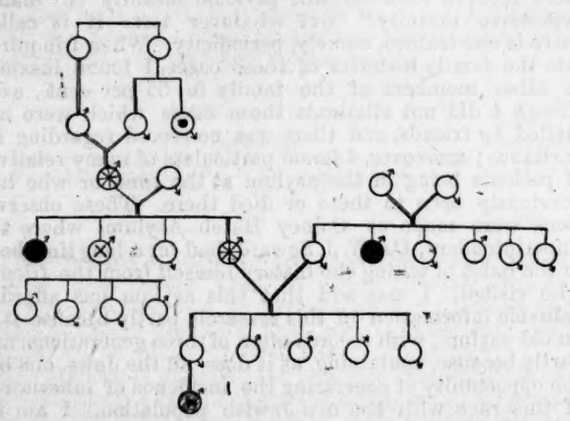

Fig. 6.—This pedigree shows the marriage of cousins; there are two members of the stock showing brilliant talents, but there is also insanity and suicide in two members. The regression to the normal is shown in the youngest generation.

I have observed in many of these pedigrees, but have not as yet compiled precise data, that manic depressive insanity in a stock is frequently associated with suicide in the members so affected, and even in others not affected. The tendency to suicide often runs in families, and some remarkable pedigrees have been published in which members of families in successive generations have taken their lives in a particular way, and sometimes even at a particular age; there is a suicidal obsession. Morel mentions an instance where seven brothers destroyed themselves, though in good positions and suffering no misfortune. Mudge, in the first number of the Mendel journal, has published a remarkable pedigree of two families that were united by marriage. In one the members committed suicide by drowning, the other by shooting. I would explain this by initiative suggestion acting on a neuropathic stock. A member of a family of four generations of suicides of which two were inmates of

London County asylums—namely, Colney Hatch and Cane Hill—and the pedigree of which I will now show you (Fig. 7), affords a striking example of suicide and insanity in successive generations. It will be observed that in three successive generations suicide was attempted or committed by cutting the left arm.

Another interesting case of a suicidal family in which a member developed impulsive obsessions of suicide and auto-mutilation occurred at Cane Hill Asylum, and was published by Dr. Devine, accompanied by interesting observations on the subject. The development of the obsessions in the patient dated from the aunt's suicide, which is a proof that suggestion was the cause, acting in conjunction with insane inheritance.

The vexed question of transmission of acquired characters, specially in relation to alcoholism, is one of great importance and interest. The assumption that the germ cells are sequestered in the body and not of the body, therefore do not participate in the biochemical changes which occur therein, and that in prolonged toxic conditions are uninfluenced in their nutrition and their specific vital energy, is contrary to reason. It may therefore be asked, how it is, as so often happens, a chronic

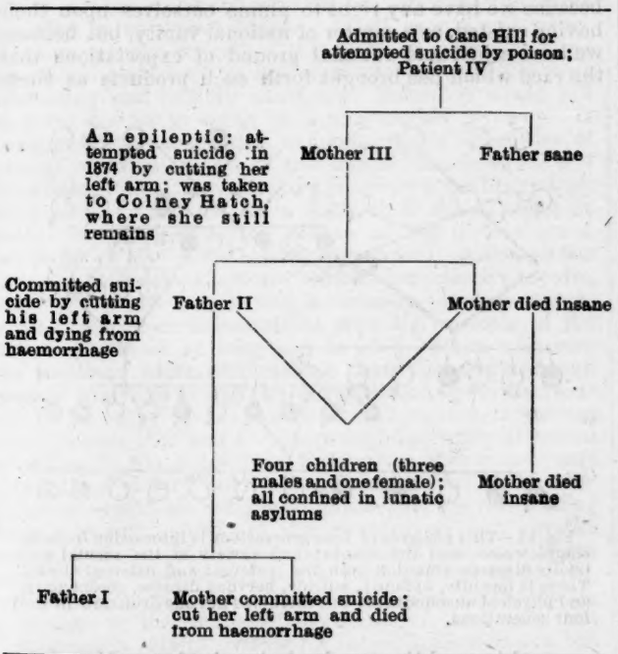
Admitted to Cane Hill for attempted suicide by poison; Patient IV
An epileptic: attempted suicide in 1874 by cutting her left arm; was taken to Colney Hatch, where she still remains
Mother III
Father sane
Committed suicide by cutting his left arm and dying from haemorrhage
Father II
Mother died insane
Four children (three males and one female); all confined in lunatic asylums
Mother died insane
Father I
Mother committed suicide; cut her left arm and died from haemorrhage

Fig. 7.—Pedigree of four generations of suicide and insanity. The stock dies out.

alcoholic may have offspring mentally and physically sound. The question is wrapped up in the causes which lead a man to drink, and my observations seem to show that a man who can drink continually for numbers of years and keep out of a lunatic asylum, a prison, or a hospital, must have possessed an inherent stable physical and mental organization, and he transmits this, the virility of the stock remaining potent in spite of the vicious habit, although it is undeniable that his offspring in all probability would have been stronger and better had he been a temperate man. Drunkenness in successive generations would indubitably lower the virility, and mental and physical degeneracy would result. Dr. Archdall Reid has expounded the tendency of the uncontrolled alcoholic type to work itself out, and the same is true of other types.

I have often noticed in the pedigrees that the children of chronic drunkards (especially when the father drank and the mother was temperate) are total abstainers. There can be no question that chronic alcoholism does figure largely in the pedigrees of patients admitted to asylums; but the same occurs—though, I think, not with such frequency—in the pedigrees of hospital patients. The accompanying pedigree was always regarded as a proof that alcoholism is productive of insanity in the offspring. The institution of the card system led to the disclosure of collateral insanity (Fig. 8). Further unbiassed inquiries on these lines are very necessary. Occasionally I have met with a pedigree (Fig. 9), such as the one I show you, in which a woman has had two husbands. By her first husband (a temperate man) she had a family of healthy children and numerous grandchildren; by her second husband (a chronic drunkard and one of a family of drunkards of several generations) she had three children, one with a muscular dystrophy, another an epileptic imbecile, and another apparently

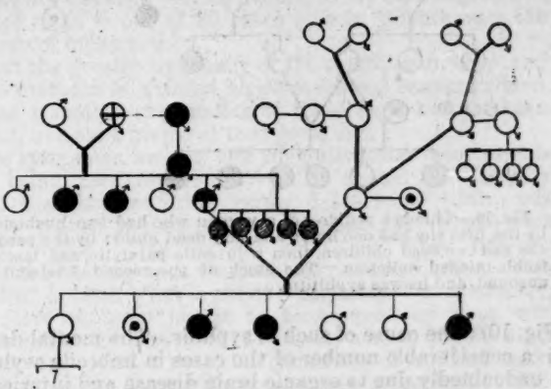

Fig. 8.—This pedigree shows three insane patients, the progeny of a drunken insane father, who, with two brothers, was in an asylum. They were, as the figures show, the offspring of a drunken mother; it was not until the card system of relatives was established that it was discovered that her sister had been an inmate of this asylum, and had died there; also it was discovered that she had had one child, who was an imbecile. Seeing that the maternal side is free from any taint in the second generation and the paternal in the first, it was regarded as evidence in favour of a drunken mother being the exclusive cause of the insane children and grandchildren. But, in the light of the doctrine of heredity, the collateral insanity must be taken into consideration.

healthy. A few instances such as this may be mere coincidence; but multiplied, seeing that they are almost of the nature of an experiment, they would form a convincing argument in support of the injurious effects of alcohol on the germ cells. It has long been the opinion that chronic drunkenness of the parents leads to mental degeneracy in the offspring in the form of feeble-mindedness and epilepsy. With this I should agree, but that the desire for alcohol is transmitted from

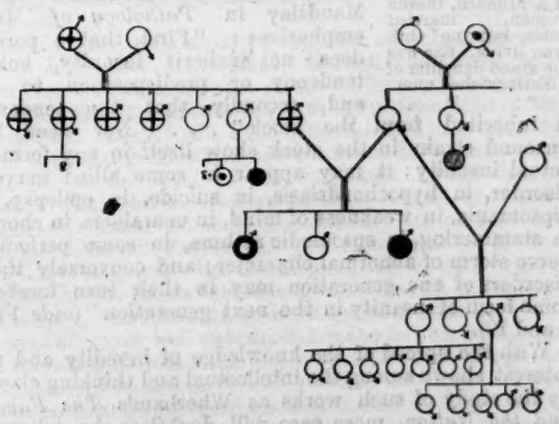

Fig. 9.—This pedigree is almost of the nature of an experiment in regard to the effects of alcohol. A woman has two husbands. By the first she has healthy children and grandchildren; by her second husband, a drunkard, one of a family of drunkards, descended from a drunkard, who died of Bright's disease, she has three children—one fairly healthy, one suffering with a muscular dystrophy, and another an epileptic imbecile.

parent to offspring, in the form of like begetting like, instead of like begetting *a tendency* to like, is without foundation. What may be transmitted is *the temperament* that induces alcoholism, namely, a lack of will power and moral sense. The transmission of an acquired character, such as the desire for alcohol, is contrary to the doctrine of heredity. In twenty-five pedigrees obtained from an imbecile asylum (Leavesden)—for which I am indebted to Dr. Elkins, the Superintendent—I observe (though the numbers are not sufficient yet to give any precise data) that the families are prolific, quite as prolific as those of

the pedigrees of hospital cases, but there is relatively a larger number of deaths from various diseases, especially tuberculosis. Some pedigrees show a large number of miscarriages and stillbirths associated with imbecility and epilepsy, and occasionally juvenile general paralysis

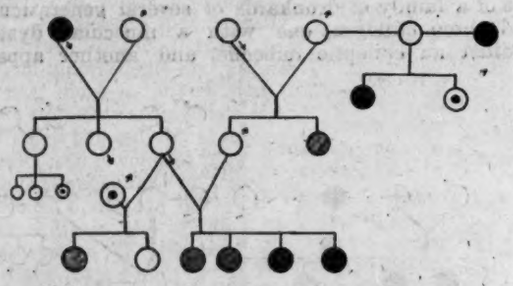

Fig. 10.—This is a pedigree of a woman who had two husbands; by the first she had one living and one dead child; by the second she had two dead children, then a juvenile paralytic, and lastly a feeble-minded epileptic. The stock of the second husband is unsound, and he was syphilitic.

(Fig. 10); the cause of such is syphilis. The mental defect in a considerable number of the cases in imbecile asylums is undoubtedly due to organic brain disease and injuries at birth, and after.

I have still another pedigree to show; it illustrates the transmission of a similar character and life in two generations, and possibly three. The grandfather was a most distinguished man who lived to a great age, much respected. He had a daughter, concerning whose mother no particulars were obtained. This daughter was a drunkard, and of a defective moral character. She had a daughter, whose conduct was similar; she has married twice, and is at present in an asylum. By her first husband she had two stillborn children; by her second husband no children; fortunately this stock has died out (*vide* Fig. 11).

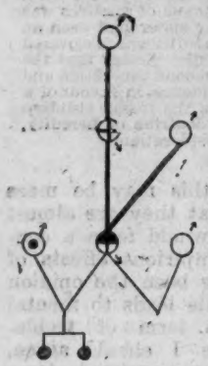

Fig. 11.—Pedigree of a drunken, insane woman, married twice, but no children living. She was the grand-daughter of a distinguished man.

A study of pedigrees teaches us the truth of the conclusions which Maudsley in *Pathology of Mind* emphasizes: "First, that a person does not inherit insanity, but a tendency or predisposition to it; and, secondly, that the tendency is inherited from the stock." . . . "Nor need the unsound strain in the stock show itself in any form of actual insanity; it may appear in some allied nervous disorder, in hypochondriasis, in suicide, in epilepsy, in dipsomania, in weakness of mind, in neuralgias, in chorea, in stammering, in spasmodic asthma, in some periodical nerve storm of abnormal character; and conversely these disorders of one generation may in their turn forebode some form of insanity in the next generation" (*vide* Figs. 6 and 12).

With the spread of the knowledge of heredity and the interest shown among the intellectual and thinking classes by the study of such works as Whetham's *The Family and the Nation*, more care will doubtless be taken in marriage selection; moreover, the cult of eugenics—literally good breeding—a term employed by Sir Francis Galton to denote the science and art of the improvement of the human race by the double process of multiplying the fit and eliminating the unfit, is daily gaining ground. Again, the study of heredity teaches that the measure of the physical, mental, and moral capacity of the individual for civic worth and usefulness depends largely upon inborn characters; you do not gather grapes of thorns or figs of thistles. Bateson has truly said, education, sanitation, and the rest are but the giving or withholding of opportunity. The diminishing birth-rate of the professional and middle classes with the high birth-rate and diminished infant mortality of the lower classes is now agitating the minds of many, but the fact nevertheless remains that Nature cares little about individuals or societies: it is mindful only of the species, and the instinct to propagate is so rooted in our animal natures that in the process of the mental evolution of man it has become the root and stem of the tree of life, upon which has been grafted the moral virtues and altruistic sentiments which are most nobly personified in maternity.

An intellectual development, whether of the individual, or community, or race, that starves the natural instincts of love, marriage, parentage, and pride of family—these the noblest of all human aspirations—will pay the penalty, and one way in which the penalty for the starvation of this instinct will be paid for by advanced civilization is the increase of the neurotic, self-regarding type of temperament, the forerunner of neurosis and insanity.

We are constantly reminded of the fact that insanity is on the increase; in the last fifteen years the London County Council have opened four new asylums and an epileptic colony, and are now building another huge asylum, and loud is the cry of national degeneracy; but when people are feeling most pessimistic of a *natural* decay of the race, it would be well if they would remember this passage from a lecture by Huxley on Harvey and the discovery of the circulation of the blood:

"I myself am of opinion that the memory of the great men of a nation is one of its most precious possessions, not because we have any right to plume ourselves upon their having existed, as a matter of national vanity, but because we have a just and rational ground of expectations that the race which has brought forth such products as these

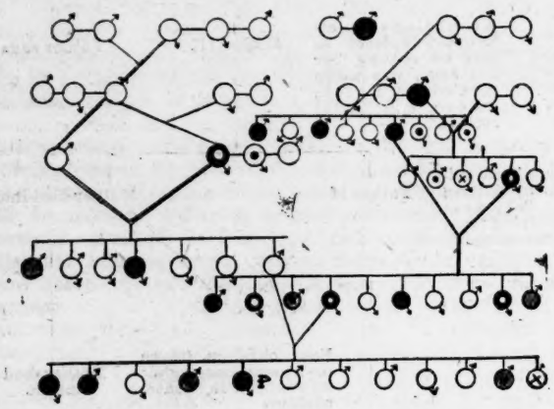

Fig. 12.—This pedigree of four generations is interesting from its completeness, and the number and variety of the mental and bodily diseases afflicting both the maternal and paternal stocks. There is insanity, epilepsy, suicide, nervous disease, eccentricity, and physical unsoundness; but there was not one drunkard in the four generations.

may, and in good time, under fortunate circumstances, will produce the like again. I am one of those people who do not believe in the *natural* decay of nations; I believe, to speak frankly, that the whole theory is a speculation invented by cowards to excuse knaves. My belief is, that so far as this old English stock is concerned, it has as much sap and vitality and power as it had two centuries ago; and that with due pruning of rotten branches, and due hoeing up of weeds, which will grow about the roots, the like products will be yielded again. The weeds to which I refer are mainly three: the first of them is dishonesty, the second is sentimentality, and the third is luxury."

CREMATION does not appear to be making much progress in Victoria, although both that State and South Australia are ahead of New South Wales in having a public crematorium. The crematorium in Victoria is at the Spring Vale Cemetery, and although it has now been established for four years, it has averaged only six cremations a year.

IT would appear from steps which are being taken in some of the Australian States that the old method of taking the oath by kissing the Bible will shortly be a thing of the past. The new form of swearing under the Evidence Act (1906), W. A., is for the witness to hold up his hand and declare: "I swear by Almighty God to tell the truth, the whole truth, and nothing but the truth." The matter is also receiving attention in Tasmania, and we learn that the Evidence Bill, which is before the Assembly, contains a provision that kissing the Bible for oath-taking be discontinued, and that the utterance of the words "I swear" should be sufficient.

The Schorstein Lecture

ON

CONGENITAL PYLORIC STENOSIS.

Delivered at the London Hospital, October, 1910,

BY

ROBERT HUTCHISON, M.D. Edin., F.R.C.P.I. ond,

PHYSICIAN TO THE LONDON HOSPITAL.

The title of this lecture is "Congenital Pyloric Stenosis," but it must be admitted that the term "congenital" is really a "question-begging epithet," for it assumes as proved what is one of the most disputed points in the natural history of the disease. Nevertheless I have resolved to adhere to it, not only because it was the title by which the condition was christened when it was first seriously introduced to professional notice, but also because the alternatives which have been suggested ("congenital gastric spasm," "congenital spastic hypertrophy of the pylorus," etc.) are all open to the same objection in an equal degree. At all events, and whatever one chooses to call it, this form of pyloric stenosis exhibits clinical and pathological problems of the most interesting and baffling character; indeed it would not be going too far to speak of it as a morbid mystery. It presents, too, a conspicuous example of the difficulties of clinical observation and of the humiliating possibility of the whole profession overlooking for years something which must all the time have been lying, so to speak, under its nose. In this respect the history of the disease has a lesson for us all. That history is soon told. Although the *flair* for medical antiquities which characterizes my distinguished predecessor in this lectureship—Professor Osler—has enabled him to unearth[1] a probable example of the disease published so long ago as 1788 by one who bore the prophetic name of Hezekiah Beardsley, and although more unequivocal examples were published by Williamson[2] and by Dawosky[3] in the middle of last century, it was not until the year 1888 that Hirschsprung[4] first really attracted attention to the condition. Even after that some years elapsed, so slowly did it attain recognition, before its existence was at all widely acknowledged, the result being largely brought about—in this country, at least—by the writings of my old teacher, Dr. John Thomson. It has now at last attained a place in the hierarchy of disease, and almost every day adds, with almost embarrassing profusion, to the published examples. I have said that this record is painful reading for the clinical physician, but lest any pathologist present should be inclined to scoff I hasten to add that it reflects no great credit on *them*, for undoubtedly babies must have been dying—dozens of them—from congenital pyloric stenosis every year, and yet its existence was as completely, and less excusably, overlooked on the *post-mortem* table as at the bedside. You say that it may be a new disease, or, as is sometimes said of appendicitis and duodenal ulcer, that it has greatly increased in frequency. I am afraid I do not believe it, for my personal experience gives me only too good reason to believe that it was simply overlooked. It was only some six or seven years ago that I was disposed to regard congenital pyloric stenosis as a myth, or, at all events, as a clinical occurrence of the greatest rarity. Then suddenly I learnt how to recognize it, and since that time I have seen a large number of cases, including twenty in private alone. Now, the only possible interpretation of this experience is, not that cases suddenly began to occur in my practice six years ago, but simply that up to that time I had been blind to their existence, and this, I believe, has also been the experience of the profession at large. Even yet it does not seem to be recognized everywhere. Cases have been published in abundance in Germany, America, and England, but in the Latin countries scarcely one. Is it conceivable that congenital pyloric stenosis does not occur in France and Italy? Is it not much more likely that, like some other diseases of Teutonic nativity, it has found difficulty in establishing its identity outside the Fatherland except in England and America, which are notoriously favourable to the admission of aliens?

Clinical Features.

In the study of the clinical features of this disease one is met at the outset by two curious facts. One is its greater frequency in boys, the available statistics giving about 80 per cent. of all cases as occurring in the male sex, whilst the other is the relatively large proportion of first-born children who are thus affected. Thus, out of 19 cases recorded by Davidson,[5] no fewer than 10 were in the first child of the family. I had almost added to these peculiarities the frequency with which the children of doctors are affected. At all events, in my own experience, no less than 6 out of 20 cases seen in private were the children of medical men.

That the greater frequency of the condition in boys and in the firstborn is without significance one cannot believe, but no plausible explanation of these facts has yet been offered, nor am I prepared to suggest one.

The symptoms are few and suggestive, the most prominent being persistent *vomiting*. It should be specially noted that the vomiting rarely dates from birth, but usually makes its appearance between the second and fourth weeks. This, as we shall see later, has an important bearing upon the pathology of the disease. The vomiting is often what is called "projectile" in character, and more material is apt to be brought up than was swallowed at the last meal. It usually comes on soon after a feed, the vomited material consisting of curdled milk, mixed sooner or later with mucus, and occasionally with streaks of blood. There is one curious fact about the vomiting which I do not remember to have seen described, but which I have often verified—namely, its tendency to cease for some hours with any change of food and to recur again as violently as ever. This is another of the many anomalous features exhibited by the disease.

At the outset, at least, the vomiting is accompanied by constipation, which helps to distinguish it from dyspeptic vomiting in which diarrhoea is usually present. The constipation is sometimes spoken of as a pseudo-constipation, inasmuch as it is not due to any disorder of the intestine, but simply to a failure of the food to find its way into the bowel at all.

Meanwhile the child rapidly loses weight and soon becomes extremely emaciated. The wasting, however, is not like that met with in cachexia. The child is not anaemic, but simply looks starved, and often remains surprisingly bright in spite of it. In this respect it differs from the wasting of most forms of organic disease, and to the experienced eye the difference often suggests a correct diagnosis.

The physical signs are few but sufficiently characteristic. In the first place, the stomach is dilated and may cause a swelling in the upper part of the abdomen, which is all the more striking in contrast with the attenuation of the rest of the trunk. On light percussion it can often be found that the greater curvature reaches down to or even much below the level of the umbilicus. Most characteristic of all is the appearance of waves of visible peristalsis. These are best seen shortly after a feed has been given, and if they are lazy in making their appearance they can often be called forth by a little gentle massage of the upper abdomen. The waves of contraction begin at the left side, where a rounded swelling about the size of a golf ball appears below the left costal margin and travels somewhat leisurely across the abdomen in an oblique direction and downwards and to the right. Before one wave has disappeared another makes its appearance, so that an hourglass-shaped swelling can be seen reaching across the abdomen. Sometimes three waves are present simultaneously. These peristaltic waves are often so marked as to attract the attention of the mother or nurse, and I have even been assured in one case that the swelling they caused was so great that it could be seen through the clothes.

This vigorous peristalsis is pathognomonic in the child, as in the adult, of some obstruction at the outlet of the stomach, and is therefore of great diagnostic value.

Curiously enough it does not seem to cause much, if any, pain, and the child will often lie quite placidly whilst the waves course in succession across the organ.

The third sign is the presence of a pyloric tumour. It should be felt for to the right of the middle line, and one should try to get underneath the stomach and compress the pylorus against the right side of the vertebral

column. As the late Dr. George Carpenter pointed out, it is often best felt by trying to pinch up the deeper structures. Sometimes the pylorus is so tucked up under the liver that no tumour can be felt, but if one is successful it feels like a hard lump almost the size of a hazel nut, but somewhat elongated.

Ibrahim[6] has pointed out that there is often a pronounced diastasis of the recti muscles in these cases, but this is no doubt due simply to the distension of the upper abdomen and is of no special value in diagnosis.

The combination of symptoms and signs, then, on which one relies for establishing the existence of congenital pyloric stenosis is: (1) Vomiting of the character already mentioned coming on within the first few weeks of life and accompanied by "pseudo-constipation" and wasting; (2) the presence of visible stomach peristalsis; (3) the existence of a pyloric tumour, if it can be felt.

Pathology and Pathogeny.

Morbid Anatomy.—The stomach in early life exhibits very clearly the division of the pyloric portion into the two segments known as the pyloric vestibule and the pyloric canal. The latter is particularly well marked, forming a tube about 3 in. long, which begins at the sulcus intermedius and ends at the pyloro-duodenal junction. If one examines the stomach from a case of congenital pyloric stenosis after death, one is at once struck by the enormous development of the whole pyloric canal, which forms a dense, almost cartilaginous, tube, the extremity of which projects into the duodenum in much the same way, it has been remarked, as the cervix uteri projects into the vagina. In addition, the wall of the pyloric vestibule is also thickened, and, indeed, that of the whole stomach to some extent, including even in some cases the lower end of the œsophagus.

It will be observed, too, that the mucous membrane of the pyloric canal is thrown into longitudinal folds, the ends of which often project into the vestibule.

On microscopic examination, it is found that the thickening of the wall of the pyloric canal is due almost entirely to an enormous development of the circular muscular fibres, although the longitudinal layer is also thickened, and the mucous and submucous coats to some extent. More careful examination shows that the muscle fibres are not only increased in number, but that each individual fibre is also broader than normal (Davidson).

So far all observers are agreed, but it is when one passes on to inquire how these changes are brought about that differences of opinion begin. Two distinct views are held:

1. That the thickening of the pyloric canal is to be regarded as a congenital malformation.
2. That it is due to overwork, the consequence of a long-continued spastic contraction.

We shall consider immediately which of these views best fits in with the clinical history and symptoms of the disease, but meanwhile we may examine them in greater detail.

1. A study of the "architecture" of the thickened muscle layer of the pyloric canal shows that it is certainly not to be regarded as a tumour formation (Wernstedt[7]), but rather as a hyperplasia. As Cautley[8] has put it: "Nature in her extreme anxiety to provide an efficient pyloric sphincter has over-exerted herself, and produced too great a quantity of muscular tissue." Granted that this were so, it is difficult to see why obstruction should result, for the mere thickness of the muscular coat should not prevent its relaxing to allow the escape of the stomach contents when required. It has also been pointed out as an *a priori* objection to this theory that infants who suffer from congenital pyloric stenosis have no special tendency to exhibit malformations elsewhere, although it is well known that, as a rule, a malformation in one part of the body is apt to be accompanied by congenital abnormalities in others.

2. The supporters of the spasm theory have got to show: (*a*) How spasm may be set up; (*b*) that it is capable of leading to consecutive hypertrophy.

(*a*) As regards the cause of the spasm, it has been suggested that it is due to an inco-ordination in the pyloric mechanism—a sort of "stammer" of the pylorus—beginning, perhaps, in intrauterine life (Thomson[9]), whereby, when the waves of peristalsis reach it, instead of opening, as it should do, it remains closed. It has also been attributed (Shattock[10]) to a hyperæsthesia of the mucous membrane in the neighbourhood of the pylorus, which induces reflex contraction—a "hysterical" pylorus, as it has been called. A third group of writers would attribute the spasm to a disorder of the chemical mechanism of the pylorus. They have tried to show that there is hyperacidity of the gastric contents in these cases, and that this hyperacidity induces the spasm (Engel,[11] Pfaundler[12]). This theory, however, will certainly not hold water, for (i) it has been shown that there is no real hyperacidity of the gastric juice in these cases at all (Miller and Wilcox[13]). (ii) Where hyperacidity exists it is almost certainly the result of the pyloric obstruction, and not the cause of it (Ibrahim,[14] Feer[15]), being comparable to the hyperacidity found in cases of benign stenosis of the pylorus in adults, which is now admitted to be due to the continuous stimulation of the gastric mucous membrane by the retained contents. (iii) In any case experimental evidence (Cameron[16]) goes to show that acid on the gastric side of the pylorus induces relaxation of the pyloric sphincter, and not contraction of it.

(*b*) The assumption that prolonged spasm of the pyloric canal can lead to hypertrophy of its muscular coat also involves certain difficulties. It would be contrary to pathological law that this should happen, unless the muscle is not merely contracted, but contracted *upon* something, so that its fibres are kept in a state of "extension" at the same time. If it be admitted, however, that the pyloric canal in infancy is a regulating mechanism which controls the passage of the gastric contents from the stomach to the duodenum, this difficulty disappears, for in that case it would be comparable to the arterioles which regulate the flow of blood from the arteries to the capillaries; and it is admitted that prolonged contraction of the arterioles can lead to hypertrophy of their muscular coat.

A greater difficulty is to explain the rapid development of the hypertrophy by this theory. Operation within as short a time as three weeks from the first appearance of symptoms has shown the hypertrophy to be already present in a marked degree, and it is difficult to conceive how "overwork" of the muscle could have led to so great an overgrowth of it so quickly.

It will be observed that there are great difficulties in the way of accepting either the congenital hyperplasia or the spasm theory, whilst the compromise suggested by some—that there is both hyperplasia and spasm—has the difficulties of both combined.

Putting aside these prima facie objections, let us now inquire which theory best fits the clinical facts.

We have already seen that there is some difficulty in understanding how a mere hyperplasia of the sphincter can produce obstruction at all; but, waiving this objection, any acceptable interpretation of the pathological appearances must explain these two important facts in the clinical history of the disease:

1. That the symptoms are not truly congenital, but often only come on some weeks after birth.
2. That the condition is capable of being recovered from without operation.

Now it is obvious that the spasm theory fits in best with both of these facts. Granted that spasm can be brought about somehow it is really easier to understand its supervention some time after birth than its occurrence congenitally or *in utero*, whilst there is no reason why, when it passes off, a return to a normal state should not be possible. On the other hand, no plausible reason has been advanced for the delay in the appearance of the symptoms on the assumption that the obstruction is due to a congenital abnormality of structure, nor can we understand how, if that were the true pathology, cures without operation, such as I shall have to describe immediately, would be possible.

The *a priori* difficulties, therefore, are all in the way of spasm; the clinical difficulties in that of hyperplasia.

Meanwhile I have no alternative theory to offer, and the part of wisdom is to suspend judgement and wait for more information. In particular we want observations with the *x* rays which might throw light on the mechanism of the pylorus in such cases, and we want also more evidence as to the state of the pylorus in those which have recovered without operation and have subsequently died some months or years afterwards from some other disease.

Treatment, Prognosis, and Course.

I propose to consider the treatment of the disease and its prognosis together, because I believe that the mortality depends very much upon the line of treatment adopted.

When I first began to recognize cases of congenital pyloric stenosis I was deeply imbued with the idea—derived from one's preconception of the pathology of the affection and the writings of others—that surgical treatment alone offered any chance of success. In the first case which I recognized in private, therefore, I strongly advised that an operation should be performed. To this the parents objected, and the case passed from my care. I subsequently learned that the child had made a complete recovery under medical treatment carried out by someone else. I need not say that this experience made a deep impression upon my mind. I was, in fact, converted to a belief in the efficacy of medical measures in this disease, a belief which subsequent experience has only deepened and strengthened, for since that time I have seen 20 cases in private practice, 17 of which were treated at home, and all these recovered without operation. Of the 3 sent into hospital for treatment 2 died.

I have perhaps been unusually fortunate, but the experience of others has not been dissimilar. Thus Heubner[17] records 19 recoveries out of 21 cases treated medically, and Starck[18] 11 out of 12, whilst of 6 cases reported by Bloch[19] and not operated upon all did well, and Bendix[20] has had no fewer than 30 recoveries out of 32 cases treated by medical measures alone.

The more enthusiastic advocates of operation have not hesitated to explain away such results as these by the assumption that the cases which recover under medical treatment are not true examples of congenital hypertrophic stenosis, but merely instances of pyloric spasm. Assuredly, however, this explanation will not do. Of my own cases, at least, I can say that they all exhibited the classical features of pyloric stenosis in a pronounced degree; and in most of them the severity of the condition was shown by the extreme illness of the child, which in many cases hung literally between life and death for weeks together. I do not propose to trouble you with particulars of these cases, but three[21] of them have been published in detail by the practitioners under whose immediate care they were, and I would ask any unprejudiced person who will take the trouble to study their descriptions whether there can be any doubt that we were dealing with extreme examples of the affection.

I have given you the results of my own experience of cases treated in private, but I admit that hospital statistics present much more unfavourable reading. In the Children's Hospital, for instance, where medical treatment alone is adopted, our mortality has been 78 per cent. in a series of 64 cases. The great majority, too, of those we have had here have died. The greater mortality in hospital cases is partly to be explained, I think, by the fact that they tend to come later under treatment when the child's strength has already been greatly reduced by the constant vomiting. I have also an impression that these babies stand the conditions of hospital life badly. They seem to become "hospitalized," and even if one succeeds in stopping the vomiting, they hang on in a miserable marasmic condition and readily fall victims to intercurrent disease. This fact, however, does not invalidate the claims of medical treatment to be successful when begun early and carried out under favourable conditions.

One may contrast with the statistics I have put before you the results yielded by operative treatment. Of these the most favourable with which I am acquainted are those of Mr. Burghard[22] who had 11 recoveries out of 16 cases—a mortality of 31 per cent. Cautley[23] reports 6 recoveries out of 7 cases operated upon in private, but a mortality of 4 out of 5 hospital cases. Of 23 cases under the care of Dr. John Thomson[24] which were treated by operation (most of them by Mr. Stiles) 15 died—a mortality of 65 per cent. We will probably not be far from the truth if we accept Ibrahim's estimate of 50 per cent. as the probable mortality amongst all cases submitted to operation.

I fully admit that such statistics do not do justice to the surgeon, for no doubt in many of the cases operation was only performed as a last resort and when the chances of recovery in any event were but small, but they are the only material available for forming a judgement.

I shall return again later on to the question of operation, but meanwhile I propose to describe briefly the medical treatment usually adopted. The essentials are careful feeding and daily lavage of the stomach. As regards the kind of food, breast milk is probably the most suitable, but owing to the frequent intervals at which food must be given suckling is impracticable. The breast milk may be drawn off and given by a spoon, but usually this practice results in a speedy cessation of the appearance of milk and has to be abandoned. In that case, or if, as often happens, the child has already been weaned before the diagnosis has been made, thoroughly peptonized and diluted cow's milk is the best substitute, but I have also used dried milk, such as glaxo, and mixtures of whey, egg-albumen and lactose, supplemented occasionally by somatose.

The marked fat retention, which has been found to take place where there is a block at the pylorus,[25] has induced some to exclude all fat as much as possible from the food. It has not been found, however, that this is of any great benefit in practice, and if the stomach is being regularly washed out I believe it to be unnecessary.

One must feel one's way as to the amount to be given at a time, beginning, perhaps, with an ounce every hour, and gradually increasing the quantity and intervals as the vomiting subsides. I think this plan is much better than feeding at long intervals, as some advise. After the feed the child should be kept lying flat and not moved about, in order to minimize the chance of vomiting.

I am convinced of the great value of regularly washing out the stomach once or twice a day, according to the frequency of the vomiting. That it is possible to treat cases successfully without this the results obtained by Heubner, who does not employ it, clearly show, but it certainly adds to the comfort of the patient, and, by lessening the frequency of the vomiting, diminishes exhaustion and facilitates sleep. By removing retention products and mucus it also lessens the catarrh and swelling of the mucous membrane, and may in this way favour the escape of the contents through the narrowed pylorus.

The technique of gastric lavage in infancy is now so well known that I need not describe it.

As subsidiary measures, I believe in the value of the German plan of applying continuous poultices to the epigastrium, and great care should be taken, as in all underfed babies, to maintain the body heat.

If vomiting be severe and the amount of food which passes out of the stomach very small, fluid should be supplied per rectum in the form of normal saline enemata, 2 to 3 oz. being given at a time twice or thrice daily. These are of great value in supplying a sufficiency of fluid to the tissues and in promoting elimination of waste products by the kidneys.

Drugs are of little help. I have tried most of them—alkalis, on the assumption that there is hyperacidity of the gastric contents; atropine and bromides as antispasmodics, carminatives and antiseptics—but the only one which has ever seemed to be of any use is opium. It may be given in minute doses (say, $\frac{1}{10}$ minim before each feed), and seems sometimes to help in allaying the vomiting, besides diminishing restlessness and promoting sleep, but I believe one can get on quite well without it. It is more highly esteemed in Germany than it is here, perhaps because lavage is less systematically employed in that country.

Under such a plan of treatment as the above the vomiting usually ceases quite soon; but it will be found that in spite of this the infant does not gain weight; indeed, it may even go on losing, and there may be little or no progress for weeks, sometimes not until the fifth month. It is at this period that one's faith in the efficacy of the treatment is most sorely tried. With perseverance, however, improvement finally sets in, and often quite suddenly the child starts to gain weight. This sudden change for the better is often very striking, and has also been remarked by Heubner.

Sometimes, on the other hand, and but all too often in hospital cases, the issue is not so happy, and, in spite of the cessation of vomiting and the consumption of a fair amount of food, the weight refuses to rise, and the child eventually succumbs apparently as the result of an "alimentary toxaemia" which seems to be the consequence of an atrophy of the bowel with impairment of the

power of absorption, probably brought about by the long period of virtual starvation through which the infant has passed. In other cases, again, one is disappointed by a sudden and inexplicable collapse just when all seemed to be going well.

What, it may be asked, is the ultimate result in those cases which recover under medical treatment? Are they entirely cured, or is there only a state of compensation established with some persistent narrowing of the pylorus and dilatation of the stomach? In some cases, at least, I believe that the cure is both complete and permanent. At all events I have examined some of my cases—and those of the worst type—five years after treatment, and found them to be perfectly healthy children, with no sign of gastric disorder or dilatation of the stomach. I know that it seems incredible, when one examines the stomach from a typical case after death, that the almost cartilaginous thickening of the pylorus which is present should entirely disappear, and a complete return to a normal condition be brought about. But we have no right to set a limit to the powers of the *vis medicatrix Naturae*, and I can only repeat that, as far as clinical observation can determine it, such a restitution to the normal does, in fact, take place. But not, probably, in all; I have certainly seen one case in which three years after apparent recovery the stomach was still somewhat dilated, and I was told that the child was subject to "stomach upsets," although well nourished and otherwise in good health. Some of the cases described by Russell[26] and Maylard,[27] in adults, and to which Dent[28] also has referred, may, perhaps, have originated in this way, although others probably belong to the Landerer-Maier group, and it is quite certain that compensation can be established with a gain in weight and disappearance of all symptoms even although some degree of pyloric obstruction, as shown by the persistence of visible peristalsis, persists. Most cases, indeed, pass through this phase, although in the great majority, probably in all, the peristalsis finally disappears. What we really need to determine the question is more *post-mortem* evidence as to the state of the stomach some years after recovery under medical treatment. Such evidence is not yet forthcoming, but we shall no doubt get it in time, and meanwhile the fact of clinical cures is undoubted whether they be real anatomical cures or no, and that, after all, is all we want.

To return, then, to the question of surgical treatment. Is operation never to be recommended in these cases? In practice I think not. I fully believe that there may be some cases which would have been saved by operation that die without it; but I know of no method by which such cases can be recognized, for one can never say of any given case that it is so bad that operation alone can give a chance of life. Of that experience has thoroughly convinced me. As a practical policy, therefore, one is obliged either to operate upon all cases in which the symptoms and signs are well marked or upon none of them, and that the former plan would result in a much heavier mortality than the latter I have not a shadow of doubt.

The only alternative to this dilemma is to treat all cases medically at first, and then to advise operation upon those that do not show any improvement after a certain lapse of time—three or six weeks have been given as the limit beyond which the surgeon should be called in. The objection to this plan, however, is that it means operating at a time when the child's strength is already much reduced and when success is not likely to be achieved, whereas, on the other hand, my own cases show that no case of the disease can be pronounced to be incurable by medical means until the patient is dead.

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An Address
ON
PRIZES AND PERFORMANCES,

DELIVERED AT THE OPENING OF THE MEDICAL SESSION AT ST. GEORGE'S HOSPITAL, ON OCTOBER 1ST.

BY

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EDITOR OF THE "LANCET."

GENTLEMEN,—I will not waste your time by expressing at any length my sense of the high honour that has been done me in allowing me to present the prizes at my old medical school, and to address you at the beginning of the new session. It would be ungracious of me, however, not to acknowledge my feeling in the matter, as the position in which I find myself is one so totally unexpected—I am, then, surprised at myself for being in this position, and I know that a good many of you, having regard to the scientific eminence of my distinguished predecessors in this function, and to their services to St. George's Hospital, must share my sentiment.

The ceremony which we have just witnessed—the award to the successful students at the medical school of the prizes which their industry, their ingenuity, and perhaps a happy blend of both qualities, which I will call their wisdom, have enabled them to win—I will take as a suggestion that to look a little into the significance of prize-giving might be interesting. All the year round, and in every class of academic, institutional, and professional training, men are winning prizes, losing prizes, competing for prizes or scratching for those competitions; and a system that is so universally in employment among us may easily become accepted by us in a mechanical way, may cease to have a reason which appeals to us, and be merely regarded as one of those things that happen in the course of education. It is these frequent and general features in the scheme of life that pass unnoticed by us because of their very familiarity. If familiarity with such a ceremony as we have just seen were all that were needed to grasp its full significance we should all know all about prizes—their uses, their abuses, and their relation to the spread of wisdom generally, and to the efficiency of students and scholars in particular. Our opinion upon the matter would be unanimous, and there would be no need for any discussion. But although we cannot conceive any system of professional training without them and their attendant troubles—namely, examinations—such clear comprehension is not ours with regard to prizes and the principle of rewarding early merit in examination by gifts, for among my hearers it is perfectly certain that there are those who have expressed opinions of diametrically opposite natures on the value of prizes, upon the system under which they are awarded, and upon the utility of examinations generally. I am certain that many of us have said that prizemen are too often found not to fulfil their early promise. This is when we hear of the insignificant future which some brilliant student has made for himself—perhaps when we find the first mathematica scholar in our batch at school as an under-master in a second-rate seminary, or notice the best classic of his year at our college dozing away a valueless existence in front of a club fire, or using his recollection of the classical dictionary in an acrostic competition. It is equally certain that many of us, in congratulating a prize winner, or perhaps, in the case of those of us who are middle-aged, in congratulating the father of a prize-winner, have said that nowadays, in a world of stress and competition, there is nothing like making a good start. And some of us have certainly said both these things, suiting our words to the circumstances. And the same diversity of view is expressed by us with regard to the value of examinations as a test of present merit or as a guide to prognostications of future success. Inevitably those who profess to hold cheaply the winning of prizes believe that the easy and rapid passing of examinations must not be credited as furnishing any sure ground for future honours.

There is, then, a considerable difference of estimate with regard to the value of prizes and the significance of passing

examinations, and this is worth a little consideration, as it happens that our educational schemes are largely founded on the promotion of the prizeman and the nurture of the successful examinee. How can thoughtful persons be found uttering such opposite opinions? But observe that, whichever view we take, we all of us accept regular examinations and regular prize-givings as the best and most practical way in which education can be conducted, though when we are called upon to express an opinion concerning the matter we are not necessarily consistent. We take one side or the other—whichever one suits the particular case—congratulations or condolences coming with equal readiness from us, but we never suggest that education can be carried on to a practical end in any other way. Verbally we may be willing to sacrifice a lightly-held conviction as to the value of prize-winning to a desire to be agreeable to some one who has not been a winner, but even then we are almost sure to endorse the principle of examinations and rewards by alluding to it as a time-honoured abuse—one of those perpetual sources of grumbling that we should all be sorry to lose. Now, all this is really an admission that there is no way of ascertaining whether students are up to a certain standard save by examinations, and that there is at least no surer way of stimulating the work of a group of students than by appealing to an honourable, as well as to an inevitable, spirit of rivalry. We have the position that a very important part of our educational system is regarded in two perfectly opposite ways by reasonable people, while at the same time those who have the most to say against it do not come into the open with any alternative proposal. And that fact should put them out of court to a great extent. But it does not. There is a feeling that there is much in both views, so much, indeed, that sincere people sometimes express one view and sometimes another upon the true value of early successes. Of course, the explanation of the divergency is the usual one where sensible people disagree, and I apologize for its simplicity—both parties are not talking about the same thing.

Those of us who cry out most clearly and persistently against the need of examinations and the reliability of prizes as a gauge of future success are regarding education, I expect, as a thing which begins at a certain time and ends at a certain time—begins, say, with the majority of us who are assembled here with our going to a boarding school, and ends with the day when we pay £5 to the Registrar of the General Council of Medical Education and Registration for the right to have our names placed upon the statutory roll of the medical profession. If this view of education be taken, it is easy not only to show that success in examinations is no certain gauge of success in life, but also that the whole system of examinations and prizes is wrong. But education does not happen to end with registration, or qualification, with the obtaining of a commission, a diploma, or a degree, and there is no professional life in which this truth can be seen more clearly than in the medical life, in relation to which it is stark staleness to say that education never ceases and that the longer we practise our calling the more we have the opportunity of learning, of testing that learning, and of obtaining its rewards. This, at any rate, is the fortunate plight with most: a few may get out of sympathy with progressive medicine as time goes on. They often began in a particularly brilliant way, and their later plight is analogous to the condition which the athletic trainer calls "muscle bound," where the muscles under excessive training in some given direction become hypertrophic, and lose their elasticity, reducing the quondam champion to a melancholy inertia. These unfortunate exhibitions of reaction, I believe, however, we shall all agree, are no longer often seen. Modern conceptions of medicine are such that all men, in whatever walk of life they are practising, feel that their life is one long education, and that all that they have learnt in the past may be regarded to some extent as an introduction to all that they are likely to learn in the future. No profession opens so many paths as medicine of a totally different sort, though they all converge to one objective—the discovery, maintenance, and practice of truth; and, as a consequence, this feeling that the whole of professional life is one long course of education appeals to us medical men with particular force. The colonel feels it as well as the medical officer of health; the operating surgeon shares it with the consulting physician, the bacteriologist, and the bio-chemist; while to none can it come more home than to the general practitioner, whose five-hundredth case of whooping-cough may give him some practical hint for the relief of a certain symptom met with in a certain type of case. Alas! that we do not get these valuable experiences recorded in any regular and systematic manner. The notebooks of a general practitioner, now that the educational level for entering the medical profession is so good, would, I am sure, make most valuable reading; but the translation of their message from the private to the public—the collation in any public manner of things in themselves so often shrouded in professional secrecy—is a matter of such difficulty that at present the clinical experience of large numbers of our calling is but little exhibited for our instruction.

This, however, is a digression, and the point which I wish to bring again to your attention is that the winning of prizes and the passing of examinations mark the results of education at one stage of a long race—the earliest stage of that race. Those who look upon education as a short race, starting in the case of the medical man with his school curriculum and ending with registration, and consider the professional life that follows as a long but completely separate race—another item on the race-card—will hold on the soundest of sporting grounds that the man who wins the sprint need not win the staying contest. And in support of this self-evident proposition we have quoted to us the instances of the various failures in after-life of men who vastly flattered their friends and tutors at the outset of their careers. Those who regard education in a more comprehensive sense, as one long event beginning with the dawn of our consciousness and ending only as our senses and powers fail us, will regard prizes and success in examinations differently. They will see in them proofs of good training, and evidence that the competitors are gauging their strength aright and endeavouring to run the trying course with judgement; and they will appreciate after-successes in life at different stages in the long race with due regard to the way in which the whole track is being covered. Regarding education in this comprehensive way, as medical men must, we find that the two contrary acceptations of the value of examinations and prizes become at once reconcilable. Examinations and prizes have their necessary place in the early educational scheme, because they are a necessary part of our determination that no one shall enter the ranks of our profession who is not so far educated that he can take full advantage for his own benefit, and notably for the public benefit, of the greater tuition which is to proceed for him during the rest of his lifetime. Examinations are a means to this end and no more; prizes are an incentive to this end and no more. Their purport being so good—namely, the standardizing up to a proper level of the knowledge of those who enter our ranks—we ought to be very sure of our ground before we abuse the means or the incentive. But while we must recognize that examinations in their place are not only necessary things but good things, we are not obliged to acquiesce in their endless and vexatious multiplicity. And those of us who admit that examinations are a valuable—and, in fact, the only—way of testing our young men may also without inconsistency deplore the present tendency of the medical curriculum, the strictly student's curriculum, which leans towards over-examination. The system is too hardly worked, because of the unfortunate feeling that all the modern development of medical science, general and special, laboratorial and clinical, ought to be represented in the examination papers. The mesh of the net spread by the examiners has become too delicate; they catch in their elaborate toils too many. We need not commend the multiplicity of examinations any more than we need lay too much stress upon them.

There is an old story of a senior wrangler who happened to enter a playhouse at the same time as King George III, on the evening when the few newspapers of the time had chronicled the scholar's success at Cambridge. The senior wrangler solemnly bowed to the audience before he sat down, believing that the national anthem was being played out of compliment to himself. Inasmuch as we must all find that senior wrangler ridiculous, the story contains in itself an exact illustration of the points which I have been

labouring at too great a length to bring out. In Georgian days a senior wrangler was a made man. There was no need for him to do more. His college made him a Fellow for life, and he became its master, or a bishop, or a judge, or did nothing, exactly as he liked. His educational prize, won at the end of his first lap, counted as a success in the long race. We see how foolish it was now, but in times much nearer than those of Good King George it was perfectly in order for the successful scholar not to try to do anything more; and Thackeray's inimitable university snobs, viewed in this light, were not failures so much as victims of a narrow view.

I am aware that here I am on somewhat delicate ground, as I may seem to be regarding knowledge pursued for its own sake and with no materialistic proposal as of little account. I may seem to slight the erudition of a Porson prizeman who is no longer a made man because of his dexterity in iambics. This is not my desire at all. The subtlest classic and the most transcendental mathematician has his place in the scheme of our education in the broad humanities, and that place is, I think, comparable to the one occupied by the elaborate bio-chemist or statistical eugenist in medicine. Their knowledge is required by us as a reinforcement of ordinary learning, as a proof of its basis, as an index to the direction of its expansion. If such learning could be regarded as a thing apart we should have the right to ask what it is for, but no thinking man should take this view. So far from wishing to say a syllable against learning pursued for the sake of learning, with no eye to a market, I wish to protest against this undiscerning and huckstering attitude. It is unfortunate that the highest ranges of philosophical research seldom bring their due return in money, and their devotees must largely depend for their reward upon the sweetness of their labours, the keen and splendid delight in the exposition of the rarest wisdom.

> The mountain sheep are sweeter but the valley sheep are fatter,
> We therefore deemed it meeter to carry off the latter,

sang the marauder. He was a wise man within his limits, for he knew what he wanted, but he was a marauder, and the triumphs won on the bleak mountain-top, though lean when viewed from a financial aspect, have a flavour of their own compared to which the more material victories of the valley are insipid. In the commercial world, where men are engaged in what Henry James has termed "the horrid vulgarity of getting in or getting out first," the creation of interests is too often intended merely to extinguish other interests. In the world of medicine the gains of one man are used for the good of all, and the supreme type of this altruism is the worker in the highest planes of research. Here, especially in this country, those engaged are far away from the pleasures and lures of tangible prizes. Unless the philosopher can by his learning show the capitalist or the shareholder how to transmute baser material into gold, it is little enough gold that he will get in return for his toil. And this is not because the exponent of the highest wisdom is necessarily a visionary, but because the application of his researches is never quickly obvious to a nation that is still in the ancient attitude regarding education—a nation which still believes that education is something like measles, which you get young and get done with. To such the man who continues in the laboratory or the library appears to be a sort of permanent invalid, removed by a malady of interesting duration from connexion with the real problems of life.

It is to my mind one of the greatest glories of modern medicine that we have taught our generation, as far as medicine is concerned, a broader view, for the whole story of pathological progress, which has been so striking during the last twenty years, may be summed up in the statement that scientific research of the highest and broadest kind in physics and chemistry—in which is included physiology—has been made to play a part in practical medicine, therapeutical and preventive. But although the profession of medicine is showing the way by which in its workaday proceedings the finest flowers of its philosophy can be gathered and used, the fact remains that prizes—material prizes—come no more in medicine than in other walks of life to the actual exponents of that philosophy. The simple way in which this great wrong could be in part set right would be by some wider endowment of teaching. Into the hands of the leaders of our thought falls the duty of teaching our students, but the duty is largely discharged as a gratuitous one. The shortsightedness and false economy of encouraging students freely with exhibitions and scholarships, while making scanty provision for those who teach them, is simply an exhibition of the old and narrow view of education. The successful student is rewarded with prizes at the end of his first lap—if I may be allowed to harp on my obvious simile; "let him rejoice and be glad in them," for assuredly his strictly academic career will bring him few more emoluments. It is an absurdly wrong policy which leads wealthy and generous persons so much more frequently to found scholarships for the students than lectureships, readerships, fellowships, and professorial chairs for their teachers. Both are wanted, but the needs of the instructed always appear in this country to appeal much more powerfully to donors than the needs of the instructors—a position which seems not to obtain in the progressive educational centres of the United States. What right have we to expect that the highly endowed student will receive adequate instruction if we fail to endow his masters. The course of education is a long one. Those who once were the taught become the teachers; they have the right to expect some continuance of the encouragement which they received at the early stages of the race.

The value of prizes during the educational career is that they help us to standardize our candidates. They are the rewards of industry and intelligence, and in this way may stimulate study. And, above all things, to my mind they do great good to those who do not get them; they persuade those people, often unconsciously, to do better work. They raise the general level of learning by forming a direct object for assiduity. Probably the fact that those who win prizes at the beginning are not always those who do well afterwards has had too much stress laid upon it. With every apology for the obviousness of what I am now about to say, it must be pointed out that the future success of a prize-winner is so taken for granted — despite the cynicism that pretends to hold the other view—that the failure of a prize-winner in after-life is always chronicled as an event. It is talked of; it is remembered; it is used to prove that prize-winners often expend themselves hopelessly in their early efforts; and yet if such were often the case none of these particular episodes would be remembered and chronicled, for it would not be worth the trouble to do so. Similarly when the man who has won no academic or scholastic prizes of any sort comes to the front in later life, the very people who beg you to mark the fact that the race is not to the swift but to the enduring, and who quote proverbs about the glitter of base metal and the staying power of the tortoise and the depth of still water, prove by their puzzlement that the event is really in their minds a rare one. As a matter of fact, of course, as we all know when we pause for a moment to think, the men who make a good start do to a great extent throughout life enjoy the advantage of that start; the fallacy lies in our not remembering how long the race is. To win prizes is only to lead at the first lap, but to say this is not to depreciate their significance; and, indeed, I now ask you to join with me in congratulating the prize-winners of the day upon the just due with which their efforts have been crowned.

A humorist once said, with regard to the success of a lady of fashion, that she progressed in comparative degrees: First she got on, then she got honour, and then she got honest. The process by which success is achieved in the great profession to which we belong is reversed, and all three degrees of comparison may never be reached. But, first, we must be honest, then we shall get honour; and lastly, though it does not follow, we shall get on. And it is not so perfectly easy to be honest at first. The medical curriculum is an exceedingly strenuous test. There is a multiplicity of subjects to be dealt with. There is confessedly inadequate time within which to acquire more than the rudiments of any of them. There is therefore an enormous temptation before every student to slur over the difficult parts, to quote in parrot-wise the phraseology of others in which to clothe personal nakedness. The very scope of the schedule within which examination questions may be set makes the neglect of numerous subjects a matter of no great risk, and many a man

among you here has left out whole slabs of a textbook with a fervent "hope that we shan't get that in the paper." Faced with this situation, the honest, or I should perhaps say *wise*, student—for here the two adjectives have the same meaning—resolves that, come what may, he will understand what he sees, what he hears, and what he reads before he proceeds to the next stage in his education. This costs him a great deal and entails upon him a rigorous process of self-examination, a determination to know himself, which constitutes his wisdom. There are things which he must know and must never forget. He will go over them until they are a very part of himself, despite the drudgery of the process. There are points which are not clear to him although they appear to be perfectly clear to his fellows. He must not be ashamed to ask, and, if necessary, to ask in public, very simple questions. In this way he lays a solid foundation for future knowledge until he finds perhaps, when erecting some higher structure upon this foundation, that he has not built so well as he thought. Later reading and later clinical experience prove to him that he has not grasped part of his back work; that he has misread it; or that he has accepted it without understanding it. Back he must go to the foundations, and cement them or shore them up, regardless of the labour and expense entailed. Here we have drudgery, accompanied possibly with a dispiriting sense of failure, but the student who is honest—that is, the student who is wise—faces the situation, and is repaid by finding that, when he returns to the higher work on which he was engaged, he can execute his task with an ease and a pleasure unknown to him before he had the support of the feeling of security. The next stage follows, and honours come; such honours as those which we have this afternoon seen distributed, and the significance of which, viewed in this light, becomes quite clear. Prizes are the sign that the student is learning to know himself; that he has subdued the natural tendency to go in the direction of the least resistance, and has determined to attack and master the allotted task. Prizes do not prove that he has succeeded in life, but they indicate that he has properly prepared himself to do so. In the long race many prize winners are passed by those who did not start so brilliantly, but let us not forget that it was the example of the prize winners, their methods, and their conception of mental training which aroused in others a proper spirit of emulation. To discuss whether the man who began as being honest, and who early acquired honour, will, in the end, get on, would be to discuss the whole race of life, and we are here only considering the early stages. But it is my belief, and I hope to carry you with me, that the honesty of purpose, the self-denial, in short the wisdom, of the prize winner, in most cases stays by him during life. Gentlemen, in our education, that education which ends only with the grave, let us echo the desire of David that our days may be so numbered that we shall incline our hearts unto Wisdom.

An Address
ON
WOMAN'S SPHERE IN MEDICINE.

Delivered at the London School of Medicine for Women.

BY

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After some preliminary remarks Mr. Roughton said: The distinguishing feature of this school is that it is for women students and for women only. It is therefore appropriate that I should say something about medicine as a profession for women, and about the suitability of women for medical work. Of late one has heard so much about the equality of the sexes that one can hardly help thinking that in the minds of many people sex distinction is chiefly a matter of costume and political disability. For such, medicine is just one of the numerous occupations which may be taken up equally well by male or female.

On the other hand, there are still some old-fashioned people who believe that woman's place is in the home, and that no occupations outside the domestic sphere are suitable for her. They are apt to forget that owing to the preponderance of the female sex there are not enough husbands to go round; moreover, there is no reason why a woman should get married if she prefers to remain single and earn her own living. Sixty years ago it may have been necessary for Bob Sawyer to engage in pugilism, cock-fighting, wrenching off door-knockers, and such like pastimes in order to make himself sufficiently brutal to be able to perform a major operation whilst the patient was writhing and shrieking in agony. Such a profession was scarcely suitable for the Early Victorian young woman, whose chief occupation seems to have been keeping her hands white and making her mouth a pretty shape by diligently repeating the words "pears," "prunes," and "prisms." The invention of anaesthetics and antiseptics has made surgery a gentle art which can be practised by the most tender-hearted man or woman.

Over and above the fact that medicine is a suitable profession for woman, there is a very cogent reason why there should be a female section of the profession. I suppose that everybody (including even the opponents of medical women) would agree that it is desirable that women should be attended by persons of their own sex, if only one could be sure that the female practitioner was as efficient and reliable as the male. The need for medical women in countries where men are not allowed to attend the female sex is, of course, obvious. Custom accounts for a good deal, and I feel sure that the present custom of women being attended by men has only grown up through sheer necessity, and that when in the course of time there is a plentiful supply of medical women, people will wonder how their grandmothers could have submitted to the services of the male obstetrician and gynaecologist.

Although there are many ailments where the sex question hardly comes in, I feel strongly that the more the sexes are separated in medical matters the better. For my own part, I should be glad to see a complete division of male from female in hospital work. The example set by the New Hospital for Women is an excellent one. I should like to see the male counterpart—namely, a hospital for men, with male officers and nurses; but I very much doubt whether a sufficient number of men would ever be found with the necessary qualities for making good nurses; but that question, though an interesting one, is outside the scope of this address.

I also think that mixed classes of medical students are undesirable, and I congratulate you on having joined a school where there are women students only. I would go even further, and would say that it is desirable that your teachers should all be women; at present such perfection is not possible, but it will come some day.

Granting, then, that medicine is a suitable profession for women, the next consideration is the suitability of women for the profession. Many women will, no doubt, be inclined to dismiss the question by saying confidently, "Of course they are suitable, just the same as men." I crave your indulgence for a few minutes in order to discuss this question, for, although I shall arrive at very nearly the same conclusion, I may be able to lay before you some propositions attention to which may tend to increase your suitability for the profession you are aspiring to enter. First, let me remind you that there are radical differences between the sexes, and that these differences are not comprised by what are usually known as the primary sexual characters; there are other differences between male and female, which are called secondary sexual characters. Some of these are self-evident and therefore well known; for instance, the greater muscular development of the male, the deeper voice, the beard, and so on. These obvious characters have little or no bearing on the practice of medicine.

There are other more subtle differences between the sexes, which are sometimes known as tertiary sexual characters, and which, I think, are more important in deciding the suitability of the sex for the work in question. These characters are especially worthy of attention, because they are not so radical and unalterable as the more obvious secondary characters; they are, to a large extent, capable of being influenced by education and by discipline. In order to understand them, it is

necessary to remember that in primitive races the different parts taken in the reproduction of children by the two sexes has made the occupations of man and of woman essentially different. Of necessity the woman has been obliged to stay at home and nurse the babes, whilst the man has had to go out and procure food by hunting and fishing; having got the food he often has to fight with his neighbours to protect his belongings. Male and female have therefore been thrown amongst different surroundings, and, in obedience to the law that organisms must adapt themselves to their environment, have developed different qualities. Thus the male has developed muscular strength, courage, and cunning in the chase; whilst the female who would rear her children successfully could only do so by unselfishness, solicitude, and sympathy. As an Australian Kurnai is reported to have said, "A man hunts, spears fish, fights, and sits about; the rest is woman's work." One of the most obvious results of this division of labour is the woman's sense of dependence upon the man.

> She has so long looked to the man as protector, breadwinner, almost as owner, as the one to initiate, to lead, to control, that her capacities have been dwarfed in these directions, her powers of self-reliance, origination, invention, have found no outlet and have in consequence remained quiescent, or at least have but feebly developed, her mental growth being rather in the direction of such qualities as are comprised under what has, in consequence, come to be called womanly sweetness, or, more briefly, womanliness.[1]

Evidently these qualities are more suitable for a nurse than for a doctor; if all women were alike in this sense of dependence upon men it is faily certain that there would be no women doctors. But the history of the woman's medical movement shows clearly that there are many women in whom the qualities of independence and self-reliance are very fully developed. The mere fact of a young woman desiring to enter the medical profession shows that she possesses these qualities in some degree; but it will be well for you to remember all through your career that there is a tendency to revert to the primordial type; therefore, take every opportunity of increasing your self-reliance by doing things for yourselves as much as possible whilst you still have your teachers to fall back upon in case of failure. Very lucky indeed are those young women who will have an opportunity of strengthening themselves in this respect by holding a resident post at the Royal Free Hospital.

Women appear to adapt themselves mentally to varying surroundings more readily than men. This peculiarity has been attributed to the necessity she has been under of adapting herself to man, always her superior in strength, and always, therefore, possessing the authority which strength confers. This mental adaptability shows itself chiefly in the greater tactfulness which the woman has no doubt acquired through the moulding influence of the stronger sex, for, finding herself opposed to brute force, and being no match for her husband in this respect, she has had to depend on other resources, defensive and offensive.

Closely allied to her tactfulness is another quality which is not so commendable. It is her capacity for dissembling. There are many reasons, which I need not enter into, which account for the undoubted fact that women are more clever at deception than men. There can be no doubt that in the practice of medicine it is sometimes necessary to deceive a patient in her own interest, but as a general rule I strongly advise you to say what you mean and mean what you say. Although this sounds quite simple and easy I can assure you that it is really very difficult and requires a great deal of practice. You will find this out when, as dressers or clerks, you write records of the cases in the wards. You will find it difficult enough to record your own observations accurately, and when you come to writing down the patient's account of his symptoms and history, and comparing it with the answers he gives to the physician or surgeon at his afternoon visit you will realize the truth of what I say.

Another result of the primordial differences in the male and female environments is that the woman's mind retains more of its child-like characters than does that of the man. All through the animal kingdom the adult female is more like the young of either sex than the adult male, and this is so in the human species. Up to the time of puberty the development of the two sexes runs fairly parallel, although from the earliest age there is a foreshadowing of essentially masculine and feminine traits. At puberty the unlikeness of the two sexes suddenly increases, the male departing much more than the female from the previous childlike characters. Thus it comes to pass that some women are inclined to be weak-willed, acting upon the impulse of the moment without due reflection on ulterior consequences; some, again, are highly emotional, passing rapidly from one phase of feeling to another—from tears to laughter, from frowns to smiles; others are wanting in control, wayward and petulant. These childish women are no use at all in the medical profession, but there are others who possess the child-like qualities of sincerity, modesty, simplicity, honesty, and trustfulness; such possessions should be carefully preserved, lest in the development of the higher faculties they be crowded out.

Coming now to the more purely intellectual powers, there are some interesting points to be noted. There is no doubt that in European races the absolute weight of the brain in men is considerably greater than in women, but when we allow for the greater size of the male and compare the proportion of brain weight to body weight, we find that women's brains are at least as large as men's, and, indeed, often a trifle larger. It is therefore not surprising that our students do just as well as, if not a little better than, the men students presenting themselves for the London University examinations. Allowance must, however, be made for the marked precocity of the female brain in childhood and adolescence. Girls between the ages of 4 and 7 have already gained 92 per cent. of their final brain weight, whilst boys of the same age have only reached 83 per cent. The girl's brain grows but little after the age of 7, and has practically ceased to grow about the age of 20, whereas the man's brain does not reach the maximum size until the age of 30. It is not surprising, therefore, that girls are often intellectually ahead of boys of the same age. It may be fairly assumed that girls of 16 or 17 have arrived at the same stage of mental evolution as young men of 21 and 22.

It is probable that there is very little difference between the intellectual capacity of the average man and the average woman. The boasted superiority of men only shows itself when we pass into the region of genius. Genius of the highest order is almost limited to the male sex, and this is in harmony with the well-known law—namely, that natural variations are more common and pronounced in the male. A genius may be regarded as an extreme natural variation, in a sense an abnormality. In harmony with this view is the fact that the opposite mental type—the idiot—is much more frequently met with amongst boys than girls.

In the matter of rapidity of perception the advantage is distinctly with the female sex; thus it is by no means uncommon for a woman to be able to take in another woman's costume at a single glance, and to do it so thoroughly that she is able to give a minute description of it to a friend. Such powers brought to bear upon the clinical aspect of a difficult case cannot fail to be of the greatest use.

In selecting things for various purposes there is a marked difference between the sexes. As a general rule a man selects a thing because it is useful, whilst a woman chooses an article because it is pretty, or because it conforms to some artificial standard which happens at the time to be in vogue.

I have never been able to find out why a woman usually prefers a delicately sharpened chisel to a screw-driver for turning a screw or for forcing a packing case open; but I am inclined to think it is due to lack of education in such matters. The problem of the screw is also a difficult one to decide, but as I have so often observed a woman attempt to turn a screw the wrong way before turning it the right way, I am inclined to think that the peculiarity must rest on some essentially sexual basis.

Women do not, as a rule, seem to be so handy as men in looking after pieces of mechanism and in keeping instruments in good order. They have a dislike for oil, and a tendency to administer a violent bang to anything that will not work. This again may be to a large extent due to the fact that girlhood has nothing to do with carpentering or any other form of handicraft except dressing dolls. In my operative surgery class I usually have some preliminary

sawing of pieces of wood before we proceed to the amputations.

There are many other points of difference between the sexes which I could tell you about, but it would take up too much time. I think I have said enough to convince you that man and woman are very different persons, and that in some respects perhaps man is at present more suited for medical work than woman, but that these differences are not all of them essential, but are capable of being overcome by education and assiduous practice. There are many men and many women who are quite unfit for the practice of medicine, and no doubt there are fewer women than men who have the necessary qualities. Nevertheless, when I compare the young women of to-day with the young women of Dickens and Thackeray, I feel confident that there will always be a sufficient and a steadily increasing number of women taking up medicine.

Just as there are differences between the medical man and the medical woman, so there must be differences in the kind of work they are most suited for. For many years to come men will continue to attend both sexes as they have done hitherto, but *you* must limit your activities to your own sex and to young children. I do not know any medical woman who professes to treat all comers, but if there is such a person I hold her to be an abomination.

More especially will you devote yourselves to the diseases peculiar to women, for they are indeed the justification for your existence. Obstetrics, of course, is a subject in which our students ought to shine. Any student from this school who failed to satisfy the examiners in obstetrics and gynaecology ought to be heavily fined. Many of you, of course, will eventually go to India and engage in Zenana work, but there is plenty of work in this country for those who wish to stay at home. There are good posts to be had under the county councils and other public bodies. I do not mean that they are very good from the point of view of remuneration, but the work required is admirably suited for the average medical woman. Although it is responsible work, it is mainly of a routine nature, and is not likely to unduly tax the woman's self-reliance by suddenly calling upon her to assume responsibility of the first magnitude.

The teaching of elementary hygiene, especially that part of it concerning the home and the care of young children, is essentially woman's work. You must not be downhearted if your teaching is spurned by some woman who will boast of having had twelve children and having buried nine of them. You will not find it wise to inquire after the odd three, as it often happens that one is a cripple, another a lunatic, and the third is "doing time."

There are many valuable resident posts in hospitals for women and children, in sanatoriums, infirmaries, asylums, etc., scattered all over the country. Although valuable from the point of view of experience, they are mostly of a temporary nature, and do not therefore offer much opportunity of earning a livelihood.

Many women are now established in general practice in most of the large towns in England, and I understand that all of them are earning a living, and some of them are doing very well indeed. I do not think all medical women are suited for general practice. The successful general practitioner must be able to work hard all day and a large part of the night year in and year out; he (or she) must be able to dispense with regular meals, a full night's rest, and an annual holiday. He must always be ready to listen to anybody's tale of woe in such a way as to give the patient the impression that his is the only interesting case in the world; he must never be impatient or lose his temper, even when, after driving several miles on a cold night, he is told he is not wanted. He must be capable of carrying any amount of responsibility on his shoulders, and of giving people the impression that he knows a good deal about his work. At the present time the majority of women employ male doctors because, having little or no confidence in themselves, they find it difficult to place any in their medical sisters; if, therefore, you have any doubt about being able to do all the things I have just mentioned, you had better think twice before putting up a brass plate. As time goes on the sex will become better educated, and there will be room for more and more women practitioners. The number of women suitable for the higher branches of professional work is necessarily small, though not smaller in proportion than in the opposite sex. Major surgery is only for the few, and I advise you not to attempt it unless you have confidence in yourself, your apparatus, and your assistants. That there are women whose operative work is of the highest excellence is proved by the statistics of the New Hospital, which, I believe, are as good as those of any other hospital, special or general.

Reference.

[1] *Differences in the Nervous Organization of Man and Woman.* By Harry Campbell, M.D.

An Address
on the
EVOLUTION OF SURGERY.

Delivered in the Medical Department, University of Manchester.

By

WILLIAM THORBURN, F.R.C.S.,

Professor of Clinical Surgery.

To-day, gentlemen, we are concerned, not with our personal losses, but with the gains of that art which so many of you will practise in the years to come, and I hope to trace with you something of the evolution of surgery as I have seen it since the time when I had the privilege to be one of Mr. Southam's students. In those days we used as our guide in all surgical matters a textbook which was not only by far the best of its day, but which still in many respects presents a model of what a textbook should be. All of us—even the least industrious—read the first two pages of this work, and there we found the following statement as to the point of evolution which surgery had then reached.

"Operative surgery," says Erichsen, "like every other art, can only be carried to a certain definite point of excellence. There cannot always be fresh fields for conquest by the knife. There must be portions of the human frame that will ever remain sacred from its intrusion. That we have nearly, if not quite, reached these final limits there can be little question. To my mind it appears as if we had already reached something like finality in the mere manipulative art of surgery and in this direction the progress of modern surgery is nearly barred."

These words were written, or at least published, in 1884. The work of Lister was already known, and his methods practised throughout the world; the new surgery had begun, but few, if any, foresaw its rapid evolution. The very word "aseptic" was then not used of operative measures. Local anaesthesia was as far removed from our thoughts as was chloroform from those of Hippocrates; and when we seek for information upon the diseases of those organs whose surgical treatment now constitutes most of the work of our hospital, we find an absolute and complete blank. Let us take but two examples—the familiar and almost friendly adenoids of our childhood, and the appendicitis which brings so much of interest to all our lives and so much of profit to the surgeon. Neither of these diseases is mentioned, or was then known; while, so far as the latter is concerned, probably any attempt at surgical treatment would have been very promptly fatal. Were it profitable it would be easy by continued quotation from the textbooks of that day to show you that the changes which some of us, who are yet far short of the allotted span of human life, have seen with our own eyes and practised with our own hands, have implied an evolution in surgery not less wonderful than the development of rapid locomotion, of distant communication, or even of aërial navigation. But it will, perhaps, be of more interest if I try to indicate to you from a comparatively short personal experience what this growth has been; and although I do not wish to trouble you unduly with statistics, I would first invite your attention to a few figures which may bring home to you what the human race has gained in one quarter of a century.

In the year 1883 I became a house-surgeon at the old Manchester Royal Infirmary, and in 1908 we saw that building closed for ever. With some personal bias in

favour of such landmarks, I have tried, therefore, by comparing the registers of these two dates, exactly a quarter of a century apart, to learn what the gain has been in our hospital alone—the gain in saving of life, in saving of limb, in saving of suffering, and in the mere economic saving of disablement from ill health which bears so heavily upon our breadwinners.

Let us first look at the mere volume of surgical work in the two years which we are to compare. In 1883 the Manchester Infirmary had one operating theatre, which was used about three times weekly, and the annual number of operations of all kinds was about 600. In 1908, in the same old building, about four times as many operations were performed, and their importance was far greater, as many of the slighter ones were no longer entered in our registers. Or, again, in the first period, about one-fourth of all surgical patients were operated upon, while in the second the number was nearly three-fourths. In spite, however, of this great increase in the amount of work the percentage of deaths *after* operation had fallen from about 10½ to about 8½, these numbers including deaths from all causes whatever and not by any means only those *due to* operation, which, could we define them, would be far fewer. Thus in 1883 we find that nearly one-fifth of the deaths after operation were due to infective conditions which are now so far preventable that we cannot possibly attribute more than 1 per cent. of the present mortality to such causes.

It is, however, when we turn to special classes of disease that we find still more striking evidence of change. In 1883 the abdomen was opened with fear and trembling, and abdominal operations were performed only in the hope of averting directly threatened death, while they were rarely, if ever, resorted to in order to relieve suffering, to restore true health, or to prevent future catastrophes. Thus, in the year of my house-surgeoncy, we find but 12 operations on the abdomen, of which 7, or more than half, died, while in 1908 we find nearly 500 of such operations, with a mortality of about 11 per cent, the mortality including deaths from such conditions as hopeless cancers, injuries, and the like, and the larger number due to too long delay in securing treatment. When you reflect that in one hospital alone this means an average of between one and two persons relieved daily from diseases of the abdomen, which would otherwise have been almost certainly either fatal or a cause of lifelong disablement, you will appreciate what such figures mean.

I will not weary you by tracing similarly the surgery of all regions, but I may tell you briefly a few other facts of this class. Many of the diseases of the kidney are very fatal or very painful, or both. In 1883 three such cases were operated upon; in 1908 we operated upon 92. The liver and its ducts are not mentioned in the registers of 1883; in 1908 there were 52 operations for such painful and dangerous conditions as gall stones and other affections of these organs. The thyroid gland, whose swellings constitute so great a source of disfigurement, of general ill health, and of fatal pressure, was equally neglected in the early period, while 27 cases were operated upon in 1908.

True you may say the fact that we operate does not prove that we cure; but I could show you, were it not that I should weary you with details, how, in every case the safety of the operations themselves has also increased. As an illustration we will take a single instance. In 1883 there were removed 29 cancers of the breast, and of the patients 3, or say 10 per cent., died; in 1908 we removed 62, by a far more radical method, giving far better ultimate results, and we had no deaths at all.

I hope I have succeeded, then, in showing you by these figures—figures eloquent in themselves, however inelo-quently presented—the gain in the saving of life and in the removal of causes of lifelong suffering.

Let us next see what has been done as regards the saving of limbs. In a great manufacturing centre like ours there are constantly occurring severe accidents, some of which will always necessitate the amputation of damaged limbs, while amputation has also to be resorted to as the only hope of saving life in some incurable diseases. So common were such cases in the recent past that many people still regard a surgeon as a man "who cuts off legs." But yearly he is becoming more and more a man who prevents the necessity for cutting off legs. In 1883 one-sixth of all the operations performed were amputations, and of these again one-sixth died. In 1908 only one operation in fifty was an amputation, and the death-rate had fallen to one in twenty-five, so that not only were many limbs saved, but the mortality was reduced in a similar ratio. Closely analogous to amputation from our present point of view is the operation known as the "radical cure of hernia," which by curing ruptures increases greatly the efficiency of the man or woman who has any form of work to do, relieves him or her from the disagreeable necessity of wearing a truss, and removes a definite risk to life. In 1883 this operation was performed three times, and the results were very uncertain; in 1908 it was performed 264 times, and nearly all cases are permanently cured.

And lastly, in order that once and for all I may have done with statistics, let me show you how far time has been saved to the disabled worker, when I tell you that in the earlier of our two selected years the average hospital treatment of a surgical in-patient was twenty-one days, where now it is but nineteen days—not a great difference, you may think, in the case of each individual, but a very definite gain to the whole community.

You will be as pleased as myself that I cannot show you by means of figures what has been saved in pain and suffering. Those only who remember the time when every wound required an almost daily dressing, with the recurrent handling of more or less inflamed and intensely painful surfaces, can realize what it means that we now leave our operations untouched for a week, and then uncover the wounds we have made, to find with certainty a perfectly healed surface. The operation of to-day implies, as a rule, a few hours of slight smarting and about two days of discomfort from the effects of the anaesthetic and the early stages of confinement to bed, after which the tedium of convalescence is almost the sole remaining trouble.

Thus it is, then, that almost imperceptibly, and year by year, we of this generation have seen the outcome of Lord Lister's great work, and have seen results from it of which he himself could have had no conception. For surgical advance unquestionably owes itself to two great fundamental discoveries, anaesthesia and asepsis. Of anaesthesia I shall say nothing; I am thankful, indeed, that it came long before my day. Whether the future may hold for us a perfection in the methods of local or spinal anaesthesia which will entirely replace general narcosis or not, at least we have now means of relieving immediate pain and shock so perfect, and on the whole so safe, that we can always operate slowly, carefully, and with precision. The hurried and brilliant surgery of bygone days is past for ever, and never again need we sacrifice accuracy to the fact that human agony could only be endured for a very limited period.

But as regards asepsis, the full value of Lister's work had not been realized in 1883, and the evolution of surgery in the five-and-twenty years of my personal experience has been mainly the development of this great advance—a development the lines of which I hope to be able to trace to-day.

It is, of course, notorious that life and limb are saved by preventing the diseases of wounds, and by the practical abolition of pyaemia, septicaemia, erysipelas, spreading gangrene, and suppuration. But it would seem to me that the operative technique of surgery owes much of its progress to a less well-recognized result of completely aseptic wound treatment. Apart from the graver infections, almost every wound was formerly associated with at least some surrounding inflammation. Even in the slightest of cases there was an area of redness extending for about half an inch from the cut surface. This area presented some swelling, it was painful and tender and the tissues involved had lost something of their normal vitality, so that if at all freely detached from their blood supply they were liable to slough or die. It matters not for our present purpose how far this was due to imperfect asepsis, or how far it resulted from the irritant action of chemicals used to prevent the more severe infections; the fact remains that five-and-twenty years ago most wounds did present some such change, and that, therefore, we could not be certain when we operated that the injury inflicted would be absolutely located to the tissues mechanically divided. To-day this is no longer the case. To-day we know that the injury done by the knife is limited to the track of the knife itself, and that it will be repaired with a

rapidity so great that after a very few hours the most extensive dissections have left no obvious trace.

It is probably to this fact above all others that we owe the comparatively recent extension of surgical dissection. The surgeon of to-day must avoid the cutting or bruising of structures essential to life. There are tracts in the brain and in the spinal cord which he must not divide; there are a few—a very few—great blood vessels which he must not tie or cut. But with these reservations he finds no barrier to his work. He can safely open, divide, and restore the great canals and ducts of the body. He can freely expose all its cavities and work in their interior with calm and confidence. He is not limited to a short direct incision giving an imperfect view of what lies beneath; he can fully reveal the parts he has to attack. Imagine to yourselves the study of a picture covered by a sheet, if, on the one hand, you must be satisfied to look through a hole in the covering, or, on the other hand, you can raise or draw aside that covering, exposing the entire picture to view, and then replacing it with accuracy and without injury. It is by raising the covering sheet that we now commence most operations of importance; the tissues of the body can be laid bare as in the dissecting room; great joints can be opened up and closed again with almost every fibre in its original position; the abdomen is opened without cutting its muscular walls; the brain can be exposed, not through a hole of, say, an inch in diameter, but by turning down the side of the skull like the lid of a box and replacing it at the end of our operation; the heart itself has of late been similarly dealt with. The perfection of asepsis has so wholly altered our methods that the greatest advances in the mechanical art of surgery in my day have, I think, been due to a freedom of action and an exposure of the field of operation which were formerly incredible.

Following this accuracy of dissection we take a further step which has also greatly assisted the evolution of our art. We now obtain a complete view of the effects of disease and of diseased areas which our predecessors did not possess and dared not seek, and in this way modern surgical operations have taught us much of the real nature of disease. So long as treatment is confined to the use of drugs or to a few comparatively simple operations with a minimum of anatomical dissection we rarely become thoroughly acquainted with pathological processes: the affected parts are never seen during life, and we have either no visual knowledge of them at all or such knowledge as we do possess is derived from an examination made after death, when the ultimate stage alone is seen, and seen under conditions far different from those of life. But let surgery enter the field and we acquire at once an actual concrete picture—certainty replaces conjecture, and we act with confidence instead of groping in the dark. How many centuries of "clinical observation" went by without the recognition of appendicitis, of the results of pyloric obstruction, or of the diseased conditions of the gall-bladder! But now that the surgeon has fully explored the once-dreaded abdomen all these things have become commonplaces of our knowledge.

We smile to-day at Aristotle's view that the brain was an organ destined to cool the heart, and that the latter was the organ of the mind, and we find it hard to believe that there could be rational therapeutics before Harvey discovered the circulation of the blood; but surely our knowledge of many diseases with which surgery now deals daily is almost as much a revelation to the present generation as were the fundamental facts of physiology to a former day. The acquisition of this knowledge of diseased processes during life and during their early stages, and the precision of observation obtained in recent years have, I think, altered our whole mental attitude and given us a clear conception of the objects of surgery, which marks a further stage in its evolution. What the skiagram has taught us about the bones the human eye has taught us about the rest of the body, and we no longer think and speak of pathological conditions as our fathers imagined them to be, but as we ourselves have seen them.

And again we are led by a most natural transition to another factor in the evolution of surgery. The extension of operative treatment has demanded and obtained an accuracy of diagnosis which was formerly not required and not obtained. The operating surgeon has been obliged to make a call upon the physician which the latter has had to meet. Perhaps I may say, without offence to my medical colleagues, that in the great majority of diseases not capable of surgical treatment exact diagnosis has little but an academic interest. Five-and-twenty years ago, if a man had a tumour of the brain or spinal cord, it was of no practical importance where it lay or what it was. But the moment that surgery can undertake to remove some of these tumours, and thus to cure the patient, it becomes absolutely essential to know their exact size and position, and as far as possible even their shape and consistency. This knowledge is urgently required in order that we may answer the questions—Can it be removed? and Where is it to be looked for? Or, again, let us consider the acute diseases of the abdomen. A quarter of a century ago all, or nearly all, of these were fatal—death was assigned to peritonitis; certain drugs were used to relieve symptoms, but nothing radical could be done, so peritonitis held the field, and was a general expression for many conditions which were not distinguished because they were of no practical importance. But now we know that to use the term "peritonitis" as describing the disease is about as enlightening as to speak of failure of the heart or cessation of respiration, and we recognize that it is but the late result of many diseases, most of which are curable by operation if the latter be performed promptly and the true starting point of trouble be attacked. Hence surgery has called for the early diagnosis of all the causes of peritonitis, and to-day the diagnosis can be made and is made. The extension of our mechanical technique has not only taught us pathology, it has made us learn diagnostic medicine.

Thus, then, the lines of advance after the elimination of pain and wound infection have been mainly the free exposure of diseased parts, the fuller knowledge gained thereby, and the greater necessity for prompt recognition of the early stages of disease. Each factor has reacted upon the other. Each step has called for the next, and has made the next more easy; as quickly as the trail is made it is trodden by many feet, and in a very few years the jungle has become a network of solid roads, from which again new byways are ever opening out.

Lastly, much has been gained in these past years by the education of the public. Some time ago I tried to show how the mortality from strangulated hernia had been diminished in a short twelve years, not only by improvements in the method of operating, but also by an increased appreciation by the profession and the public of the necessity for promptitude. Not many years ago the patient "submitted to operation," as it was called, only after long delay, after many conferences with friends and with those surgeons who were almost regarded as foes, and after a prolonged trial of methods differing little from those of the days of Galen. To-day there is little question of "submitting to operation"; it is now often more difficult for the surgeon to discourage the useless than to urge the necessary. The laity has learnt what can be done, and the consequent demand for the surgeon's service has tended ever to increase the value and the readiness of that service.

And thus we now attack nearly all the strongholds of disease, while new triumphs and new conquests follow with bewildering rapidity. In 1876 Lawson Tait first removed some stones from the gall bladder, and the daring operation was regarded as one which might be occasionally adopted. In 1909 Mayo Robson had collected 3,000 of such operations performed by three surgeons alone, and with a mortality of less than 2 per cent. Some twenty years ago the operation of gastro-enterostomy was introduced to surgery; it is now one of the commonest of remedial measures, and many thousands have been rescued by it from the slow martyrdom of so called dyspepsia. In 1896 an Italian surgeon, Farina, made the first attempt to suture a wound of the heart itself, and in 1909 Vaughan collects 150 cases, with 35 per cent. saved from certain death. Still more recently we have seen successful operations for the diseases of the heart, while an ingenious device now makes it possible to open the chest with the surrounding atmospheric pressure reduced to that in the bronchial tubes, and thus to operate upon the lungs and pleura. Not long ago the diseases of the brain and spinal cord were beyond the reach of surgery; but they are now attacked with no inconsiderable measure of success, although we must admit that in this branch of our work we have had many disappointments, mainly,

perhaps, because diagnosis has here not kept pace with surgical requirements. And of the other great organs of the body we have said enough. Surely operative surgery had not reached finality thirty years ago, and surely we may look to the future for an evolution not less wonderful than that of the past.

But, gentlemen, there are few gains which carry no losses in their train. When we speak of our triumphs and our hopes let us not forget our perils and our pitfalls, and let us pause for one moment to ask ourselves what may be the greatest dangers of modern surgery.

In the first place, we have, perhaps, a tendency to operate too readily, and without due care for preliminary diagnosis. Doubtless it is better to "look and see" than to "wait and see," but it is better still to look with the clearest possible certainty of what we look for. Haphazard explorations and operations undertaken because "something must be done" are a moral crime from which we are, perhaps, not altogether exempt. The very safety of surgery tends to diminish the sense of responsibility with which such operations are undertaken. The fact that in so many cases an operation is performed with ultimate recovery may also make us lose sight of the fact that recovery might have occurred without the operation, and that the latter is not in itself a good or a desirable thing, even in the twentieth century. At the outset of your career, gentlemen, I would beg of you always to ask yourselves before operating, "Is this necessary?" and to remember that unless you can answer in the affirmative even the modern operation is a thing to avoid, while it should never be undertaken without a clear and definite aim.

A closely allied danger is that of extreme specialism, which is another term for limitation of thought. Our bodies are not made, like our ships, in water-tight compartments. You cannot derange one organ or one function without also injuring others. Specialization is to some extent inevitable, because the ground to be covered in the study of medicine is so enormous that no human being can be equally familiar with all its parts; and in surgery especially the acquirement of technical skill requires the concentration of our attention on certain regions. But although inevitable it is none the less a misfortune of modern surgery. It tends to narrow our view, to make us lose sight of the human being in the consideration of our own favourite corner of his frame, to lead us into locating all his ills in that corner, and sometimes perhaps to make us operate upon that corner when it would have been wiser to adopt other measures. Is there not reason to fear that there are to-day some well-known, greatly distinguished, and exceedingly brilliant surgeons whose reputation for—let us say amputating the little finger—is somewhat shadowed by the suspicion that they may amputate that digit when it was hardly worthy of such honour. This tendency we all have to resist, and resistance is not made more easy by the attitude of the laity, who almost demand that our work shall be thus one-sided, although they are not always so crude in their reasoning as the gentleman who, having been told that he was suffering from neurasthenia, looked up that condition in an encyclopaedia, and then consulted a well known surgical 'specialist" on the ground that he found it in the appendix.

On the other hand, it is also doubtful whether our present lines of professional cleavage are the best. To-day we make a sharp division between medicine and surgery—a division dating from long before the dawn of modern surgery. We have physicians who devote themselves to one branch of therapeutics, and surgeons who, perhaps, tend to exaggerate the other. Is this a good thing or is it a permanent condition? This question I for one am not prepared to answer. We may admit that in many cases the patient would probably be the gainer if the physician were ready and able to perform his own operations—if, for example, the great neurologist could remove the cerebral tumour. On the other hand, we must admit that a wide experience of general surgery is essential to one who would perform any operation, and that if the physician is to operate at all, the members of the senior branch of our profession must condescend to soil their hands with all the details of the work which we surgeons have evolved from the homely task of the mediaeval barber. That this could be done, and might be done, is possible, and I think it not improbable that ultimately it will be done. At least there is a great precedent in its favour in the fact that a large section of the surgical work of twenty-five years ago has now been cut adrift under the name of "gynaecology," in which branch of medicine the old distinction of physician and surgeon has almost disappeared.

However this may be, let us not lose sight of the fact that, after all, the greatest surgeon is the greatest healer, and not necessarily or invariably the most dextrous operator. And we may humble a little our pride in our art when we consider that it is, after all, an imperfect means towards one great end—the extinction of disease. Great as have been its triumphs, and greater still as we hope to make them, the greatest triumph will be when a fuller knowledge of the causes of disease, a more perfect development of preventive medicine, a higher evolution of social law, and a nobler gift of individual self-control shall finally eliminate, or shall truly cure, those human ills with which in our imperfect knowledge we still deal so crudely. The removal, the readjustment, and even the replacement of parts of the human frame are not in themselves our ultimate ambition. At the best we may venture to hope that they are but a passing phase, for, however skilfully we may handle the knife, it must always be an evil in itself, and the day may come when it can be laid aside for ever. Surely we may trust that in the endless war against disease, the scalpel and the suture are no more the final hope of medicine than are the *Dreadnought* and the rifle the last resource in the civilization and progress of mankind.

Doubtless, gentlemen, it is too much to hope for the realization of such a dream in the lifetime of any who are here to-day; but it is not too much to expect and trust that you, who are now devoting yourselves to the great study of medicine, may hereafter play a worthy part, not only in advancing the art of surgery, but also in replacing that art by the still more perfect methods which it is our duty to seek, and to which ultimately we may attain.

SEVENTY-EIGHTH ANNUAL MEETING

OF THE

British Medical Association.

Held in London on July 22nd, 23rd, 25th, 26th, 27th, 28th, and 29th.

PROCEEDINGS OF SECTIONS.

SECTION OF MEDICINE.

R. W. PHILIP, M.A., M.D.Edin., President.

PRESIDENT'S INTRODUCTORY REMARKS.

IN the course of his introductory observations the President said: The Section of Medicine—sometimes known as Internal Medicine—had formerly a more preponderating position at the annual meeting than to-day. With the growth of specialism and the advances of surgery the realm of medicine has been invaded and new Sections have been created. Such invasion, far from limiting the activities of medicine, has widened its horizon. We may certainly anticipate that year by year the deliberations of this Section will become of greater scientific value. It is significant of the present-day outlook in medicine that the two subjects selected by the Committee for discussion this year concern groups of symptoms rather than distinct affections of one or other organ. The physician of to-day is not content to wait for completed pathological processes. Short of the determination of fixed changes within an organ, he has to deal with the latent period of disease—the period when disturbance of normal function is not yet stereotyped in gross anatomical change. It is the *métier* of the physician to detect such fugitive manifestations. The physician is primarily a physiologist. His knowledge of normal processes makes him quick to recognize slight divergencies from the normal. His pathological knowledge enables him to interpret these, and

frequently to offer successful opposition to the progress of tissue change. In respect of treatment, *Obstare principiis* is his watchword. Every day his attitude becomes more definitely preventive.

If we ask wherein especially the present-day outlook of medicine differs from that of former times, even of a generation ago, the answer which occurs most readily is, in the part assigned to toxic influence in the production of disease. The answer is readily made, but how many of us realize its far-reaching meaning? Take as illustration the phenomena of tuberculosis. Gradually we have come to larger and truer views of the tuberculous process. The local lesion, whether in lung, intestine, kidney, or other organ, is getting its proper place. The local lesion is accidental. The essential element is an advancing toxaemia. The toxin is common to all the varying manifestations of tuberculosis. In proportion to the degree and intensity of the toxaemic process the illness is serious. On this account a small focus of disease may be of vastly greater moment than disease involving a much larger area. It is for this reason that exception is to be taken to the usually accepted classification of pulmonary tuberculosis, which has regard to extent of anatomical change rather than to degree of systemic intoxication. Before anatomical changes are registrable by clinical methods, or while anatomical changes are so slight as readily to be missed, there may be evidence of toxaemic disturbance. The influence of the toxin may be traced more or less certainly in every function of the body. The toxin I believe to be a neuro-muscular poison. Hence the advancing muscular dystrophy, the loss of muscular tone, the increased myotatic irritability, the disappearance of flesh—that is, muscle, not necessarily fat—the sense of tiredness, disinclination for effort, gastro-intestinal disability, and circulatory enfeeblement. The onset of these slighter systemic disturbances is the time for successful opposition. At this stage antagonism is relatively easy. It may be too late when the system has become saturated with toxins or when gross anatomical changes have developed in the lung or elsewhere. In this sense there is special significance in the latter-day view that tuberculosis is much more common in childhood than is generally supposed, and that the manifestations of its presence may be at first comparatively slight. The frequency of tuberculosis in childhood explains many points previously obscure. The grave character assumed sometimes by so-called minor ailments is in large part referable to pre-existing tuberculous disease. I am much impressed by the frequent coincidence of one toxic influence with another in childhood. The high mortality of measles is chiefly due to pre-existing tuberculosis. Take another disease not commonly regarded as related to tuberculosis—namely, chorea. Up to the present I have, with careful search, failed to meet a case of chorea which has not responded positively to the cutaneous tuberculin test or has not yielded other proof of the presence of tuberculosis. Cases have been sent to me as offering negative evidence, but fuller examination has shown the evidence to be positive. It may be that this is not a universal statement, and for the present I content myself with the suggestion merely. It seems worthy of record that for a prolonged period I have departed from the recognized therapeutic methods, and have treated pronounced cases of chorea—some of gravest character—by means of tuberculin, with uniformly satisfactory result. The same outlook has guided treatment in certain obscure illnesses of childhood. The significance of tuberculosis in childhood is, then, not limited to the tuberculosis as such. Widely distributed as the infection is, it is to be interpreted—even when itself not of immediately aggressive character—as a devitalizing factor, lowering the tone and resistance of the individual, so that he succumbs more readily to other infection and less successfully resists its advance.

DISCUSSION ON ACIDOSIS.

OPENING PAPER.

By Professor DAVID L. EDSALL,
Philadelphia.

IT is not uncommonly true that when the knowledge of a subject is relatively new, the whole matter appears clearer than when more has been learnt in regard to it. This has been very true of acidosis; a few years ago certain large facts seemed quite well established, and in many ways easy to comprehend. Since that time an enormous amount of work has been done upon the subject. It has among other things developed the fact that the question is one of the most complex in all medicine, and in the course of this work most of the points of importance in regard to acidosis have fallen more or less into dispute, and some of those that seemed relatively clear in the earlier stages of our knowledge of it are now decidedly unsettled. It is so complex a subject, and one which has been so very actively worked upon, that I shall have to speak in a very sketchy way, and of only a limited number of matters that bear upon it. Most of what I shall have to say will deal with the physiological and pathological sides of the matter, as these, rather than any purely clinical questions, are at present the things of chief importance in any discussion of the subject. It is not necessary to go into the history of the development of a scientific conception of acid intoxication out of those vague ideas that referred all conceivable things to acids in the system, ideas that are still widespread among the laity, and among even a fraction of the profession. We now know clearly, since the work of Walters and of many since his time, that acids as such, experimentally used, are capable of producing a somewhat peculiar train of symptoms when ingested in large amounts. We know also that the organism normally meets the presence of acids in the system by using an available alkali that is not essential for other purposes, namely, ammonia, and that those animals that have from their food considerable ammonia available, have the greatest power of withstanding acid intoxication, while those that have less ammonia can stand less acids. As a consequence of the use of ammonia to neutralize the acids, ammonia is excreted in abnormally large amounts in the urine, and the presence of ammonia in the urine in abnormal quantities becomes therefore an index of the extent of the acid intoxication.

In regard to human beings, we know that similar circumstances maintain in certain pathological conditions. Only one form of acid is known to occur in the body in quantities that are sufficient in themselves to be dangerous from the effects as acid. The acid in question, since the time of Stadelmann and Minikowski's first work upon the subject, has been clearly recognized to be β oxybutyric. It has likewise been abundantly shown that the acetone and diacetic acid which occur in the urine in these circumstances, and which were recognized long before the β oxybutyric acid itself, are oxidation products of the latter, and, contrary to earlier views, they have little if any importance in producing symptoms in the conditions in which they are found. Diacetic acid is not directly toxic, and it occurs in too small amounts to be of very noteworthy importance as an acid. Acetone probably occurs in only very small quantities in the organism, possibly never in more than slight traces, and as it is of only mild toxicity, at any rate it may at most be considered to have but a small direct share in any severe toxaemia that may occur, but it may perhaps damage the kidneys (Satta, Ewing), and thus perhaps complicate matters by tending to add renal insufficiency to the pre existing toxaemia.

The evidence that we have, then, leads by exclusion to β-oxybutyric acid as the important one of these three substances, and there is also very direct positive evidence that it is an important cause of symptoms. The chief points in this evidence are that the amounts found are at times so large as to be clearly dangerous (Magnus-Levy); that the organism is known to respond freely to its presence by neutralizing it with ammonia and to some extent with other alkalis, and the administration of alkalis in large amounts often does good, and not infrequently does very striking good, even in the presence of very severe toxaemia, their effects having been especially demonstrated by the Naunyn school, and their value being admitted even now by those who do not grant that acid intoxication constitutes the whole story in those conditions in which acids are present in very large amounts. As further evidence of the importance of this acid, the symptoms produced when signs of intoxication accompany its presence are similar to those in experimental acid intoxication. We may say, therefore, without question, that β-oxybutyric acid has a large share in producing the intoxication that occurs in diabetes and occasionally

in other conditions, and that its acid effects are an extremely important factor in the intoxication. This acid, as Taylor has noted, has the dignity of producing the only distinctly recognized form of intoxication arising within the organism—namely, the only recognized form of autointoxication.

When, however, we come to ask whether the coma of diabetes, and the exactly similar coma occasionally seen in other states, is due wholly to acid intoxication, we have a somewhat different question; and it is still another question when we ask what is its importance in the variety of conditions other than diabetes in which it is often found, but usually in amounts too small to be the evident cause of symptoms through its acid effects.

I do not think we can say that excess of acid produces all the intoxication symptoms in diabetes. In some instances it seems to be practically the whole cause, as the use of large amounts of alkalis temporarily overcomes even profound symptoms in occasional cases, and certainly postpones them frequently; and, as I stated, the amount present is known in some instances to be large enough to be dangerous from the effects as acid. Also, there are in these cases no other known causes to which the symptoms may be attributed. So far as the evidence goes, then, it is the only known cause of the symptoms, and at times seems to be a sufficient explanation. In some instances, however, treatment with alkalis, even when carried out before the symptoms have become dangerous, is extremely unsatisfactory, and it is only occasionally successful in desperate cases; indeed, the therapeutic evidence is looked upon by a number of important students of the question as being amongst the strongest evidence that acid intoxication alone does not wholly explain the conditions.

Sometimes, of course, the intoxication is undoubtedly a mixed one, the kidneys particularly being liable to failure, and a uraemia complicating a previous intoxication. But even when this is not the case the acid intoxication must be admitted to be a severe cause of secondary disturbance of metabolism, and hence, in addition to the effects as acid, other intoxications may secondarily arise, and it is possible that these help to explain those cases in which a pure acid intoxication is not sufficient explanation. At any rate, at present we must admit that in the first place the matter is, from the pathological standpoint, too complex to make it probable that the symptoms are always due purely to an acid intoxication alone, and the clinical evidence is too equivocal to permit it to be used to support such a contention. While we do not know other causes of symptoms in these conditions, and cannot separate those cases in which there is probably a pure or almost pure acid intoxication from those in which this is not the case, we must admit that other causes probably act in a considerable proportion of instances together with the acid intoxication.

As to those conditions other than diabetes in which the evidences of acidosis are relatively slight, this is the case in a variety of states: In starvation, in various poisonings, especially from some of the narcotics; in digestive disturbances, in cyclic or periodic vomiting, which is almost certainly not a simple digestive disturbance; in acute yellow atrophy and phosphorus poisoning, in eclampsia, in the vomiting of pregnancy, and in other conditions. In considering these I think we must grant that there are two types of acid intoxication, looked at from the pathological standpoint. I shall speak somewhat more at length later of the well-known fact that the occurrence of large amounts of acids in diabetes is known to be dependent upon two main factors—the inability to use carbohydrates and the coincident excessive use of fats. I have already mentioned also that no tissue lesions sufficient to explain the intoxication symptoms are found in diabetes. These same conditions obtain in starvation, for in starvation no carbohydrate is taken, and large amounts of body fat are burned. Starvation acidosis is, therefore, to be looked upon as of the same type and significance as that which occurs in diabetes, though nearly always of milder form, probably chiefly because of shorter duration. Starvation also plays an important part in many of the other conditions mentioned in which acidosis occurs, for the patients are often taking little or no food, or they are at times on a diet so distorted as to contain little or no carbohydrate. Hence this type of acidosis, that is clearly due to an abnormal diet, frequently plays some rôle in all these states.

But in many of the conditions under discussion the diet plays a secondary rôle, and at times none at all, for the outbreaks with which the acidosis is associated may occur while the patient is taking a normal diet. I have seen the acidosis clearly marked with the very beginning of the symptoms when there has been no change in the diet. In this point, then, these cases may clearly differ from the diabetic form.

Furthermore, and still more important, these conditions often show very serious lesions that may of themselves evidently be enough to produce violent symptoms; and, as noted, the signs of acidosis are quantitatively too slight to make it probable that the acid plays a large rôle in producing the serious symptoms. These are the various sorts of cases in which, following the Naunyn school, it is often customary to speak of acidosis as distinct from those cases in which the acids evidently themselves cause the symptoms, and which are said to show acid intoxication. As I have noted, there is clearly a reason for making such a distinction between them, for in these varied conditions the acids are unquestionably of secondary importance, but I think there is a tendency on the part of many writers to speak too lightly of these milder acidoses.

There are practical as well as theoretical grounds for believing that the acidosis, though a secondary matter, cannot wisely be neglected, and may be important in producing or at least in keeping up symptoms. One reason for this that may perhaps have some importance is that von Noorden, Satta, Ewing, and others have given evidence that the acetone bodies in moderate amounts may produce some damage to the kidneys, and hence their presence may be of importance in this regard.

Then, too, I have suggested, and I think upon reasonable grounds, that the severe autolytic changes that are so very common in all these various conditions may be furthered by the acidosis, for we know that acids favour autolysis, and, granting that an abnormal autolysis is once set up, it is surely likely to be increased by excessive amounts of acids in the organism. Indeed, in delayed chloroform poisoning, for example, it is possible now to form a picture, still hypothetical to a considerable extent to be sure, but suggestive of the course of events. The work of Howland and Richards on chloroform poisoning, together with Howland and Richards's work showing the remarkable heightening of the effects of indol when substances that cripple oxidation are used previously (such substances as cyanide and chloroform), would indicate the possibility that in this form of intoxication autolytic processes are set up in the liver particularly by means of substances that may perhaps come from the digestive tract, and may be of the indol group, under circumstances not clearly known but apparently likely to be accompanied by decreased oxidation processes. Further, the work of Reicher on the influence of narcotics upon the fat content of the blood shows that such substances as chloroform mobilize large amounts of body fats. The oxidation processes being probably reduced by the chloroform, the fats are not properly oxidized, and acids accumulate in large amounts. There is every reason to think, then, that these acids would increase the previously existing autolytic changes. That the acids do harm in these conditions is shown by the fact that in a fair proportion of cases Wallace and Gillespie and others have shown that treatment directed against them (carbohydrate food and alkalis) will go far towards preventing post-anaesthesia intoxication. It is not improbable that a similar course of events may occur in periodic vomiting. Alkalis do good in some of the latter cases, and if the explanation that I have suggested be correct their good effects would be due more to their preventing the acids from furthering additional autolytic tissue change than to the amount of acid that they neutralize. This view would harmonize the fact that they do good in some cases with the fact that the acidosis seems to be too slight to be the main cause of symptoms.

The lack of good effects from alkalis in many cases of this disorder could then be explained by the fact that the autolytic changes and the very complex intoxication that must be associated with them have become so pronounced that the acids play but a minor rôle.

I wish it to be understood that what I have just said is largely hypothetical, and I introduce it only to show that acids in these cases may theoretically have importance, and alkalis are known therapeutically to be useful at times. When we are dealing with cases of this group, we need to look upon them as being of a separate type from diabetic acidosis, because we are always dealing with most complex conditions and commonly with very severe tissue lesions. The acidosis is certainly usually a minor feature, while in diabetes it seems to be the major feature; but even though a minor feature, it is one we can attack with occasionally great usefulness therapeutically, and it would appear that it sometimes assumes the major rôle in determining the course of the illness, probably not so much from the quantitative effects of the acids directly as acids as through their effect upon other pathological processes. While of a separate type and of a slighter degree of severity, these forms of acidosis cannot be considered of negligible importance practically or theoretically.

It is of much pathological interest to note the very great frequency with which changes in the liver, probably autolytic, are associated with the varied conditions that exhibit this type of acidosis. This, together with the observations of Geelmuyden, Embden, and Michaud, and others, on the relative amounts of acetone bodies found in the liver, as compared with other organs, and on the results of perfusion of these bodies through the liver, indicate a probable close relation between the liver and the formation or distribution of acetone bodies; and the fact that Mosse, Heiberg Ewing, Rott, and Tugendreich have all found basophilia of the liver protoplasm in a variety of acidoses of this type and absence of the basophilia in other organs when looked for, suggests also that the acids may exercise especially damaging effects upon the liver. This again is evidence that they may be very active in furthering the autolysis or other changes that occur there, and without being produced in very large amounts, for in many of the cases studied by the authors mentioned there was but a mild grade of acidosis.

I have said nothing about any form of acidosis except that due to β-oxybutyric acid. I think there is nothing concrete to say about any other acids as causative of symptoms. Many persons have attempted to attribute pathological importance to lactic acid. This question was very justly dealt with by Bainbridge in his Arris and Gale Lecture in 1908, and I can only agree with him that it is impossible now to show that this acid is of any pathological importance. We have, to be sure, some general evidence that unknown acids other than oxybutyric are probably important at times, but at present it is fruitless to attempt to attribute a rôle to any particular individual acids.

I would now turn to one or two other questions that are of especial interest in this subject.

First, the question as to the manner in which the acids produce their effects. Much work has been done on this point in England in recent years, and I may well leave the details of its discussion to some of the gentlemen present who have contributed to this work. I will only say that I believe it is impossible to attribute the symptoms to any one effect or to any one substance such as CO_2 accumulated in excess. We may readily—particularly in view of the work of Beddard, Pembrey, and Spriggs—believe that the respiratory disturbance is to a large extent the result of the action of the organic acids on the respiratory centre, affecting it much as CO_2 normally does but in excess. This point is of interest in some other connexions, and especially, as I have previously suggested, it is desirable to study the curious air hunger occasionally seen in the absence of any clear cause, but usually associated with digestive disorder and most commonly occurring in children, to determine whether moderate grades of acidosis may not be active in producing it. Acidosis of mild form is certainly common in the conditions in which this occurs, and alkalis appear to help overcome it.

The general nervous symptoms occurring in severe acid intoxication, and especially in coma, I think we cannot yet safely pin down to any precise effect. It may be due to direct effect of the acids upon the brain tissue (the protein). Or it may, in view of what we have recently learned of the influence of the fixed alkalis upon the nervous system, be due partly at least to their abstraction by the acids; and it is extremely desirable that the relation of the fixed alkalis to the acid intoxication and its symptoms be much more thoroughly studied than has been the case, especially in view of Taylor's observation that an ash-free diet may set up signs of acid intoxication—an observation which is made more pertinent by the fact that Bunge and Lunin have made similar observations experimentally on animals.

Again, the nervous effects may very readily be due in large part to a mixed complex disturbance secondary to the accumulation of acids, just as in lead poisoning violent cerebral and some other symptoms seem to be due less to the direct effect of the lead than to the secondary effects of its influence on the tissues. Further, it is not yet ruled out that these symptoms are due in part to a directly toxic action of β-oxybutyric acid or its salts.

Finally, we need to give attention to the possibility that the effect may be directly analogous to that of the narcotics. In view of Reicher's demonstration that the narcotics flood the system with lipoids, and Wilbur's work indicating that the sodium salt of β-oxybutyric acid is toxic, and in view also of some well-known facts regarding the effects of small amounts of soluble soaps of lower fatty acids in dissolving or emulsifying neutral fats and lipoids, I have suggested the possibility that the attack of the organic acids may in more or less considerable part be upon the lipoids of the nervous system, and resemble that of the narcotics. I find that this question has been very suggestively worked upon from another point of view by Winogradoff in Freidrich Müller's laboratory, and he has kindly given me the main results of his as yet unpublished work, which indicates that the organic acids act in part as acids through their free hydrogen ions, but in part as narcotics through the influence of the undissociated molecules upon the lipoids. If this interesting work is confirmed it will go far towards explaining the fact that alkalis do good but are not completely satisfactory, and at times even wholly unsatisfactory, in controlling the symptoms. The manner in which the acids exert their effects is far from settled, and it is quite probable that the effect is complex. So far as we yet know the acid influence would seem to be often predominant, but in different instances the results may vary.

Finally, and in many ways the most important practical question of all, In what manner does the large accumulation of acid occur? and as a corollary to this question, How far are we advanced toward controlling this accumulation? The prominent demonstrated points are that a lack of ability to use carbohydrate, or a lack of carbohydrate food in the diet, and especially the consequence of this, which is the use of a large amount of fat in the food or the consumption of a large amount of body fat in order to make up the deficiency, is the main cause of the accumulation of fatty acids. As is well known, there are two possible explanations advanced for this—either the organism is overtaxed in its powers of utilizing fats because of the large demands that are made upon fat metabolism, or some interaction occurs normally in the combustion of carbohydrate and fat, and in the lack of the former the latter are not properly burned. There is difference of opinion still as to which of these is the case. The evidence shows that the latter almost certainly occurs in many instances. In some cases, however, as with the anaesthetics, the organism does apparently become flooded with fats, and in most of these cases there is no evidence of inability to use carbohydrate, and at times no lack of carbohydrates. It is probable that in these cases the fat metabolism is crippled by too much labour thrown upon it, or by disturbance of oxidation and the like, and the carbohydrate metabolism may play no direct rôle. In the more severe cases, particularly the diabetic cases, the disturbance in the carbohydrate metabolism probably secondarily causes the disturbed fat combustion.

It has been difficult to understand the accumulation of β-oxybutyric rather than diacetic acid or acetone. β-oxybutyric acid may be readily burned by the diabetic organism, while diacetic acid readily forms acetone, and the latter does not burn. It is especially difficult to understand this point, since no general disturbance of oxidation can be demonstrated. Within a few months some highly interesting contributions have been added to our knowledge

of this matter, which have very important physiological significance, and already some suggestive clinical bearing. Almost coincidently, Maase, Blum, and Dakin showed that the administration of diacetic acid to animals and perfusion of their livers with this acid results in the formation of β oxybutyric acid; and Neubauer has demonstrated, in a paper read at the German Congress of Internal Medicine, and of which he kindly showed me the manuscript, that in his own cases, and in all the cases that he could study properly, the amounts of oxybutyric and of diacetic acid run in a certain almost constant relation to each other, and he also showed the transformation of ingested diacetic acid to β oxybutyric acid in diabetic subjects. In other words, the reaction appears to be clearly a reversible one, and a definite equilibrium is maintained between the amount of β-oxybutyric and of diacetic acid. This shows why an accumulation of oxybutyric rather than of diacetic acid or acetone occurs, and it makes it evident that in acid intoxication there is a hitch in the oxidation beyond diacetic acid, or, more probably, that normally the oxidation does not go over diacetic acid, but that the latter is a transitory stage, and it is all reduced back to oxybutyric and then directly oxidized. Woodyatt believes that it all goes back over dioxybutyric, which very easily oxidizes, as he has demonstrated *in vitro*. Neubauer's results have a more directly practical bearing also, in that they show that the easy estimation of acetone (which is chiefly an estimation of diacetic acid, as Folin showed) is, contrary to previous teaching, a satisfactory clinical method of determining the degree of acid intoxication, since the relation to oxybutyric is constant in the same individual.

We do not yet know what the hitch is in this process when acidosis develops, nor the rôle that the carbohydrate plays. We have, however, some important sidelights upon that matter that have a certain degree of practical value even now, and that offer the most hopeful outlooks toward prolonged and successful control of acid intoxication. The use of carbohydrates has long been known to restrain the acidosis, and in mild cases to cause it to disappear, but it has the unhappy disadvantage that it is very likely ultimately to do harm through making the diabetes itself worse. Three main methods of attacking this difficulty have been used. It was shown by Schwartz and others that different fat foods vary in the amount of acid that they produce, those containing much of the lower fatty acids being especially harmful. This is of some practical value, as the diet can be modified somewhat in accordance with this. But its value is limited, and is likely to remain limited, if for no other reason because the diet of the diabetic is already sadly restricted, and we need to seek to add more to it rather than to eliminate from it. Aside from such simple and useful measures as the use of fresh and washed butter instead of old butter, which contains more lower fatty acids, not much has come of this. In regard to nitrogenous foods, it has been shown that they vary greatly in their influence upon acidosis. It is now quite clear that protein foods, as well as fats, may increase the acidosis, though they are certainly of much less importance than the facts in this regard. It is, at the same time, clear that proteins have two contrary effects, one to produce more acids, the other to reduce the amounts of acids—that is, they have both the so-called ketogenic and the antiketogenic effects. So far as we have learnt, these effects are exerted, on the one hand, from splitting off carbohydrate groups, which act like ingested carbohydrate, though they are more easily burned by all except severe diabetics. On the other hand, the amino acids of which proteins are composed have a two fold influence, some of them increasing acidosis apparently simply by yielding the fatty acids of their molecules, some of them, however, having a restraining effect. The idea naturally arises that the choice of proteins in the diet can be made largely with a view of their effect upon acidosis. This plan can be used in severe cases to add a fraction of help to other measures, and is useful to that degree, but the practical limits upon this line of work must again be very narrow because of the marked restrictions that it adds to the diet.

It is in the third method that has been used—namely, in the attempt to provide a practical substitute for sugar-yielding foods—that real success seems most likely ultimately to be reached. It is quite clear that sugar itself is not the special thing that controls the acidosis, but rather some of the combustion products of sugar. There has been a lively search for one or more normal products of sugar, or some substitute for these, that would serve to control acidosis. A variety of substances have been found to act in this way, and some are perhaps normal combustion products of sugar—gluconic and glutaric acids, alcohol, glycerine, etc. For a variety of reasons none of these has proved to be of noteworthy practical value except alcohol. Some investigators denied earlier that alcohol was antiketogenic, but Neubauer has clearly proved that it is, and there can be no doubt of its value in controlling acid intoxication when quite generously used. There is, however, an important toxic element in alcohol, and at times it seems to make the diabetic worse, though the observations that showed this were usually temporary, and it is possible this effect may pass off, particularly in view of the studies of Dixon and those recently made by Richards, which indicate that an immunity develops to the toxic effect of alcohol. At any rate, alcohol is limited in its effects, and is far from perfect, and has a toxic element, and the search for a better substitute goes on. Woodyatt, in work as yet unpublished, of which he has given me an abstract, has done perhaps the most suggestive work upon this line which has yet been accomplished. He believes, for various reasons that he advances, that glycerine aldehyde is probably a normal combustion product of sugar. He finds that it very largely reduces acidosis, and is not toxic in any evident way, and he has also noted the very interesting fact that it is apparently transformed into sugar. His work is very valuable and encouraging. It is possible that his figures indicate that the effect is really a toxic one on the kidney, and that it suppresses the excretion of acetone bodies rather than diminishes their amount; but this is less likely, since some of the glycerine aldehyde is built up into sugar.

In this latter line, then, there has been very useful progress, and while we have not yet reached extremely important results, the outlook for finding the key to the puzzle is very encouraging. It should not be overlooked, however, as Joslin insists, that our strongest point in overcoming acid intoxication in spite of all this work is still, for the present, the very careful treatment of the diabetes itself and the attempt gradually to train the carbohydrate metabolism back to the point where it can utilize more carbohydrate, and thus do away with the acid intoxication.

DISCUSSION.

Dr. E. I. SPRIGGS (London), after referring to the able and comprehensive introduction of Professor Edsall, said that he thought the distinction between the acidosis of starvation or of diabetes and the acidosis incidental to the acute diseases mentioned was a superficial one, as in the latter group there was abstention from food and vomiting, and therefore deprival of carbohydrate. Acidosis came on very rapidly when vomiting was severe. He doubted whether the presence of oxybutyric and diacetic acids had much to do with the disintegration of the liver in acute yellow atrophy, phosphorus poisoning, post-anaesthetic vomiting, recurrent vomiting, and the toxaemic vomiting of pregnancy; for although it was true that an acid reaction had been shown experimentally to favour autolysis of the liver, yet in diabetes these acids were known to be present in the body for months and years without causing disintegration of the liver, and this even in the forms of diabetes which ran a rapid course. The presence of degeneration of the liver could not be looked upon as a distinguishing feature of importance in separating the various forms of acidosis, because in those forms in which no gross lesions of the liver were found there was, nevertheless, a failure, through overwork, of the important liver function of elaborating fats previous to their oxidation. Dr. Spriggs then referred to a series of experiments carried out in the years 1903-06 by Dr. Beddard, Dr. Pembrey, and himself upon 25 cases of diabetes, including observations on the urine, the blood, and the respiratory exchange of severe diabetes, with controls upon mild cases and upon normal subjects. They held the view that diabetic coma was due to poisoning by acids, and thought the points referred to by Professor Edsall against that view were of less weight than the

evidence for it. In severe diabetes the alkalinity of the blood was depressed; the tissues, the blood, and the urine contained abnormal acids, and analyses of the urine showed that the body suffered a depletion of bases. Moreover, much alkali could be given without rendering the urine neutral or alkaline, and the only means which had resulted in rescuing many patients from coma and restoring them to a further period of life was the administration of large doses of alkali. It was sometimes pointed out that the symptoms of diabetic coma were not identical with those of the other acute diseases associated with acidosis. If this implied a doubt as to the presence of acid poisoning it must rest upon the other conditions and not upon diabetes, in which disease the metabolism had been more thoroughly investigated. In diabetes the acidosis was of long standing, whereas most of the other diseases were acute, and different effects were often produced by the same cause, according as its action was gradual or sudden. Acidosis in diabetes might arise in two ways: First, from indulgence in carbohydrate above that amount which could be burnt in the body, the power of burning that food became gradually lost, so that the body had to use an excess of fats; the complete oxidation of fats then failed, with the production of oxybutyric acid, diacetic acid, and acetone. Secondly, acidosis might be brought on if the patient was too suddenly deprived of carbohydrate food. When a patient was placed upon a strict diet, within a few days the appetite failed, nausea, pain in the abdomen, and constipation appeared. This was due to a development of acidosis from the strain thrown upon the oxidation of fats. Curves were shown from analyses of the urine by which it could be seen that at such a time the ammonia rose, whilst the total nitrogen often fell. The CO_2 in the blood was lessened, and the alkalinity of the serum also fell. These phenomena were the initiatory phenomena of diabetic coma. They usually passed off, but putting a patient suddenly upon a strict diet involved the risk of coma, and had, in his opinion, often led to it, especially in institutions where the patient was put into bed. He never put a diabetic into bed if he could help it. In private practice patients did not carry out dietetic restrictions to the letter, and had sometimes saved their lives by their disobedience. The risk of acidosis in diabetes could be combated in two ways: First, by preventing or postponing its onset; and, secondly, a valuable but only palliative method, by treating it with alkali. The prevention of acidosis lay in determining how much carbohydrate the body could use, and in allowing that amount and no more. By this means, with regulated short periods of a strict diet occasionally, the assimilative power of the body could often be retained for long periods and even improved. [A diagram was demonstrated showing that giving bread and potato in limited quantities had reduced enormously the excretion of oxybutyric acid and diacetic acid.] The dietetic treatment of diabetes required, therefore, to be carried out with great discrimination between restriction and allowance. The treatment was laborious; it was expensive. It required skill, and, what was more than skill, persistent and watchful care. It was, however, in the present state of our knowledge, the rational way of preventing or postponing the onset of acid poisoning.

Dr. Langdon Brown (London) said it could be definitely asserted that acidosis due to oxybutyric acid and its derivative was due to starvation. A patient receiving nothing but salines per rectum would always develop acidosis within forty-eight hours. It was particularly due to deprivation of carbohydrates, but was also seen in oxygen starvation, as in mountain sickness and bronchopneumonia. Probably the aldehyde structure of the sugars enabled them to combine directly with oxygen, and therefore in the absence either of carbohydrate or of oxygen incomplete oxidation followed. During starvation autolysis came into play and less important tissues such as the fats were largely drawn upon, and the fatty acids resulting from their breakdown were completely oxidized. To be eliminated they drained ammonium from the proteins or drew on the fixed alkaline bases. The amount of alkali which had to be given in excess of two drachms of bicarbonate of soda before the urine was rendered alkaline afforded a convenient measure of the degree of acidosis. Even the cases due to severe liver disease might be explained by an "internal starvation" when the large part played by the liver in preparing the foodstuffs for the use of the tissues was considered. A diabetic might be able to metabolize laevulose, oatmeal, or potato starch when unable to assimilate other forms of carbohydrates. In other forms of acidosis dextrose must be given, if necessary per rectum. Citric and glutinic acids could replace carbohydrates to a certain extent. In giving alkalis, sodium should not be given alone, but half as much potassium and one-twentieth as much calcium and magnesium should be added.

Dr. Leonard Guthrie (London) dealt with the subject of acidosis in cases of delayed chloroform or post-anaesthetic poisoning. The view emanating from anaesthetists that fatalities after chloroform anaesthesia were due to overdosage or to over concentration of the drug at the time of administration was untenable. Were this the cause such fatalities would be of frequent occurrence. None of the patients in his own experience who died of delayed chloroform poisoning had shown the ordinary signs of overdosage at the time of operation; and, conversely, none who actually received an overdose developed fatal symptoms later. Chloroform given in massive doses and for lengthy periods no doubt produced fatty liver in animals, but it was impossible to believe that in a healthy child profound fatty metamorphosis in the liver and other organs could be the result of chloroform given in doses not exceeding a drachm during a period of from ten to fifteen minutes. The theory that idiosyncrasy accounted for delayed chloroform poisoning had to be abandoned when it was shown that similar effects followed administration of ether, ethyl chloride, and nitrous oxide. Moreover, some patients who succumbed after administration of chloroform had been chloroformed with impunity on previous occasions. Idiosyncrasy could not be present at one time and absent at another. He thought that perhaps too much had been made of carbohydrate starvation as the cause of post-anaesthetic acidosis, although he agreed that long fasts before operations increased the dangers of anaesthesia. Dr. William Hunter had stated his opinion that if a patient "had always a very nutritious and easily digestible meal, well sweetened, two or three hours before operation, the fatal effects of delayed chloroform poisoning would in all probability be completely prevented." But this was precisely the kind of meal which had usually been given except in cases of operation of extreme urgency. Were starvation alone responsible for deaths after anaesthetics, operations, for instance, on patients suffering from intestinal obstruction who had often been unable to retain nourishment for several days, would necessarily be fatal. He was interested in the remarks of Dr. Spriggs on excess of carbohydrate diet as a cause of acidosis. He believed that an excessive carbohydrate diet was the cause of one form of cyclical or recurrent vomiting with acidosis, in children, and that these were potential victims to "delayed chloroform poisoning." Such children craved for carbohydrates, which they seemed unable fully to metabolize. Consequently the liver became loaded with fat and glycogen. At intervals the hepatic machinery for the metabolism of food broke down, and the result was a fit of cyclic vomiting and acidosis. He believed that operations under anaesthetics on the eve of an attack of cyclical vomiting were particularly dangerous, though in the intervals between the attacks they might be safe. Any anaesthetic, by interfering with oxidation and metabolism in general, might act as the last straw on a liver already overtaxed, and annul its functions in dealing with fat, glycogen, proteids, toxins, and micro-organisms. No operation of expediency should be performed on a child without inquiry as to history of past attacks of cyclical vomiting. When such a history was forthcoming the operation should be delayed for a week or two, during which appropriate diet, with limitation of carbohydrates and fat, should be provided. A similar course of treatment was advisable even when no history of cyclical vomiting could be elicited, as an anaesthetic might precipitate an impending first attack. In regard to the treatment of post-anaesthetic poisoning, not being a believer in the carbohydrate starvation theory, he doubted the efficacy of dextrose, which had been recommended. As to alkalis, he could only say that all patients in his experience had received large injections of normal

saline solution, with a view to neutralizing the acids supposed to be present, without the slightest benefit.

Dr. M. S. PEMBREY (London) said it was necessary to remember that the acidosis of disease was not a condition which had no representation in physiological processes. There was a great increase in the production of carbon dioxide and lactic acid during muscular work. In the acidosis of diabetes there was a relation between the alkalinity of the serum and the amount of carbon dioxide in the venous blood, the two rising and falling together without being actually parallel. It was not surprising, therefore, that the theory was advanced that the blood was unable, owing to its diminished alkalinity, to take up the normal amount of carbon dioxide, and the tissues became overcharged with the gas; deep breathing would result from the increased pressure of the carbon dioxide in the blood which supplied the respiratory centre in the medulla, and the nervous system generally would be affected by the excess of that gas. In short, diabetic coma might be considered to be a narcosis produced by carbon dioxide. The observations made by Dr. Beddard, Dr. Spriggs, and the speaker did not support this view, and they had suggested an entirely different explanation of the phenomena. The observations upon the blood showed that there was no evidence of an increased pressure of carbon dioxide; the blood in the arm of a diabetic patient could take up as much as 60 volumes per cent. of carbon dioxide. Moreover, blood from cases of diabetic coma absorbed carbon dioxide when it was exposed at a temperature of 37° to an atmosphere containing 4 to 6 per cent. of carbon dioxide. Further evidence could be obtained by an examination of the air from the alveoli of the lungs. Analyses of such samples would give the pressures of the carbon dioxide and of the oxygen in the alveolar air, and these would afford evidence of the condition of the blood in the capillaries of the lungs. The alveolar air was an index of the severity of the acidosis, and during the typical breathing of a patient in diabetic coma the percentage of carbon dioxide might be as low as 1.5 or 2 per cent. The respiratory quotient was about 0.6. Their view was that the respiratory centre was stimulated by the other acid bodies present in addition to carbon dioxide; that the resulting hyperpnoea reduced the carbon dioxide in the blood and in the alveolar air. The results would indicate that it was useless to give oxygen, for there was plenty of oxygen, 17 to 18 per cent., in the alveolar air. The deep breathing was a response to the stimulating action of the acid substances, both the abnormal and the normal acid carbon dioxide. Observations made upon the effect of muscular exercise upon healthy men and diabetic subjects would indicate that in some cases muscular work would be useful, for it increases enormously the processes of oxidation in the body; in others it would be a danger, especially if it were excessive and suddenly undertaken in a patient who had led a sedentary life. The exercise increased the carbon dioxide and also the lactic acid; these factors acting with the abnormal acidosis might produce coma. The law of excitation must be remembered; the greatest effect could be produced by a sudden change. In a patient whose power of accommodation was limited, safety lay in a slow progressive change in diet or muscular activity.

Dr. J. H. RYFFEL (London) said pathological acidosis had its physiological analogue in the acidosis of starvation and of exercise. In starvation the acidosis was very slight, being mainly due to the acetone bodies, which caused an increase in the acidity and a relative rise in the ammonia of the urine. Mild exercise caused no acidosis unless associated with starvation, the effect of which it exaggerated. Violent exercise, such as running for four to five minutes at a pace sufficient to cause dyspnoea, produced all the signs of acidosis, except coma. The acidity of the blood, the acidity and ammonia of the urine were increased, and the alveolar carbon dioxide was markedly reduced at the end of the period. The cause of these changes was lactic acid, the amount of which in the blood was increased, with the result that it was excreted by the kidneys, so that the urine frequently contained 0.5 per cent. The administration of oxygen had no effect on the appearance of lactic acid under these conditions, so that this effect was not due to lack of oxygen. Moreover, lack of oxygen only caused an appreciable formation of lactic acid if extreme and long continued. The effects of the acidosis of violent exercise formed a useful confirmation of the views of Drs. Beddard, Pembrey, and Spriggs on diabetic coma, that the coma and increased respiration are the direct result of the acidity of the blood, and not due to carbon dioxide, of which the quantity in the lungs and blood is much reduced. The acidosis of exercise produced exactly similar effects on respiration, which were best explained by supposing that the activity of the respiratory centre was regulated by the acidity of the blood. Increased carbonic or other acid raised the acidity of the blood. That increased respiration, with the result that the carbon dioxide of the blood fell, and the blood became less acid. If, however, other acids than carbon dioxide were present in such quantity that the blood was still too acid, respiration continued increased until these acids disappeared from oxidation and excretion.

DISCUSSION ON CHRONIC CONSTIPATION AND ITS TREATMENT.

OPENING PAPER.

By J. F. GOODHART, M.D., F.R.C.P.

CONSTIPATION is an unnatural delay in the passage of the intestinal contents along the colon. In the small intestine the contents travel rapidly. If, as occasionally happens, a fistulous opening exists between the lower part of the small intestine and the abdominal wall, it can be seen that but a few minutes elapse between the imbibition of coloured fluid, such as stout, and its appearance in part at the fistulous orifice. Six to ten minutes has been about the time in the one or two cases I have seen. Dr. Hertz has of late made many observations on this matter by means of bismuth meals and the *x* ray screen, and the actual passage of the intestinal contents has been watched *in transitu*, and it is now certain that the chymey contents of the small intestine pass rapidly along that length of the bowel, and that delay does not occur there. The small intestine can therefore be dismissed from consideration. Constipation concerns the colon only.

But what constitutes delay? This is by no means an easy question to answer; but we can again appeal to the extremely instructive observations of my colleague Dr. Hertz, for by these the physiological rate of movement of the intestinal contents along the canal has been shown by demonstration. It would appear that the average time taken by food in passing from the caecum to the rectum is, say, fifteen hours. From the time when the food is taken into the stomach will be five hours extra, and the actual defaecation will be several but an uncertain number of hours more, owing to delay in the ampulla or collecting chamber. Dr. Hertz gives forty hours as the time by which a meal taken in, ought to have been completely passed out.

Constipation falls into two groups of cases: constipation in the colon and constipation in the collecting chamber or rectum. The one is dependent upon an automatic reflex outside the control of the will; or indeed, if volition can be said to have anything at all to do with it, it would seem to be pretty nearly always in opposition. The other is largely aided by voluntary effort, and the trouble only or chiefly comes into being when this fails.

Of the latter form not much need be said; it is mostly present in old people or in women of lax habit who have borne children, and in such as have habitually neglected themselves, and it is best dealt with by local measures, such as enemata.

Constipation of the main tract of the colon is a much more intricate and, I may add, interesting affair, and is in the main a physiological one. Its causes concern themselves with: (*a*) The nervous and muscular apparatus of the intestinal wall; (*b*) the intestinal contents and their movement under muscular propulsion. There is the mucous membrane to be considered also, but inasmuch as absorption, secretion, and excretion are conditioned by the nervous energy supplied to the glands, the mucous coat may be considered to be included when we deal with the nervous circuit.

It hardly needs to be asserted that the nervous element is a preponderating one, for it is clear that the temperament of the subject, his nervous vigour, habit, each and all need consideration, if, indeed, it be at all possible to give it them. For instance, take the temperament of the individual: some are always constipated, it is their natural habit; in others the nervous centres have been taught to respond, perhaps frequently (a most inconvenient habit), but for present purposes let us say at too long intervals, and thus the habit of constipation has been *acquired*. Others in the daily, even hourly, expenditure of nervous vigour and the oscillations of energy that come thereby, easily become so. Thus will it come and go in accord with the presence or absence of mental stimulus, as looseness again may equally do. Excessive muscular effort or nervous discharge of varied kind may produce similar results, either way, and thus lead to constipation in some, as the result of too prodigal expenditure of force upon the preceding effort. It is no uncommon observation that excessive exercise on one day may be followed by constipation on the next: the current supply of nervous energy in the accumulators has been overdrawn, and some of the natural functions are damped down as a direct sequence. Once again, constipation is often the very earliest indication of an oncoming mental derangement of a severe kind, and I cannot but think that the boot is too often put on the wrong leg when the mental depression is ascribed, as is so much the fashion, to the toxic effects of an intestinal poison. I may appeal also to an even commoner condition of the same sort, where many will tell, in the mental exhaustion and general neurasthenia that is apt to succeed to many febrile conditions, that they are much worse on those days when the bowels act—thus showing that by the mere effort of this natural function virtue has gone out of them—than on those days when they are confined. This most intimate dependence of the action of the bowels upon the equable flow of nervous energy, and the easy switch-off that takes place between cerebral and abdominal centres, is beyond dispute, and yet it is often forgotten or taken no account of. In association with this point is another interesting one that must surely be of like kind: accompanying nervous bankruptcy, even of temporary character, such as a sudden shock, there may come a change in the character of the colonic contents, which may, I think, be not incorrectly described as *immediate*, and the output, from being soft and healthy, is converted into scybala of the most compact and painfully inspissated kind.

Related also to nerve failure as causes of constipation are many of the disturbances of secretion, absorption, and excretion, associated as they are with flatulence, pain, and muscular cramp.

I must not say more on this head, except this, that a function so delicately sensitive to impulse as is this, must necessarily be largely ordered and controlled by *education*—that is, by *acquired habit*—and so we know that chronic constipation is in many the result of long neglectful irregularity.

And now for a moment let us consider the physiology of muscular propulsion in the colon. It is largely aided, and even initiated, by outside agencies, such as the vigour of the body generally, the tone and development of extrinsic muscles, and sufficient exercise. Into these details I cannot enter, since I am more concerned to allude to the *intestinal muscle* as taking the dominant part.

I doubt if peristalsis ever receives its due meed of appreciation, in its constancy, its deliberation, its strength, and its directness of purpose. It seems to me such a sublimely dogged action that towards it a respectful and expectant attitude—an attitude of trust—should be the dominant trend of management. In the state of health it is probably always in action, but so impalpably that even its own convener does not know it. But though so deliberate for the most part, it rouses itself into considerable effort in shifts after each meal, and sends on the intestinal contents at a quite appreciable rate; and on occasion, as we too well know, it is a veritable sleeping dog, which, when waked, is capable of exerting a really terrific force. Call to mind how the bowel when in travail will knot up into such hard masses that the unwary may easily mistake the lumps so formed for solid tumours; and how, in the churning action that then goes on, all solid matter is invariably converted into sludge, in the persistent effort of the intestine to pass it on. And so it happens that if in a supposed case of obstruction scybalous masses are to be felt in the rectum, it is very probable that there is no obstruction, or at any rate none low down in the bowel, as had been thought. I have often found this useful.

It also occurs to me to say, when speaking thus of the movements of the intestine, how seldom in the treatment of constipation do we take its complement—diarrhoea—into consideration. The two apart are but the natural rhythm disintegrated—a disintegration that is apparently very easy to effect, so that the bowel has ever at command its own remedy—namely, this enormous reserve of power of action if it should consider it necessary.

I have yet one word more on the function of the intestinal muscle. We talk much of kinks and adhesions as causes of constipation and obstruction, not discerning, as it seems to me, that the especial function of peristalsis is to *get round corners*, and that all day long it is making crooked paths straight. Surely a muscular tube that plays vermicularly—that is, engages all its attention upon one minute length at a time—does not know what a corner is. I take it that any ordinary kink or adhesion cannot be such a ready explanation either of constipation or obstruction as might at first thought appear, for the intestinal muscle is only performing its main duty in dealing with it. Thus it happens that intestinal growths, *by destroying a definite length of muscle*, are mostly provocative of these evils.

There are two periods of life when the muscular power is especially likely to be wanting, and thus to become an important factor in the onset of constipation; in infancy and early childhood the muscle has not yet acquired its strength or its habit, both which come largely by education; and in old age it has lost much of what it had. And yet in either will it rapidly make it up if in the one there should come any local irritant, in the other an intestinal stricture.

The *contents* of the bowel still remain for mention. It is obvious that the muscular peristalsis is largely dependent for its due performance upon adequate contents. It has been said that, although there is a continuous muscular propulsion always at work, impalpable, unrecognizable, albeit capable of being roused when necessary into a force of no common order, yet on the whole the intestinal action is largely also a matter of shifts at or after meals. A man who has a headache and lives on tea and toast, or a little soup on one day, has no reason to expect, and probably will not get, any action on the next; no coal has been worked to yield it. It is a matter of common observation, and I may add of common sense, that if a man starves one day he will be constipated the next; and I even make bold to say that the absence of even *one* meal on any one day in properly educated bowels may delay the output the next. All clinical evidence goes to show that to ensure regularity of the bowels *the colon must be full*.

My conception of a natural colon is that of a canal moderately distended by pultaceous or softly scybalous gas-permeated contents, upon which the mucous surface is always feeding. Even the rectum feeds upon its contents, and if, when it arises, the natural impulse to defaecation be not gratified, the material becomes reduced in quantity by further absorption, and the impulse vanishes until such time as a further shift takes place. The muscular coat of the bowel, like that of the pregnant uterus, is always in action, and so makes insensibly for the slow propulsion of the contents, but it is probable that the muscular play *between the shifts* is more concerned with *keeping the food in contact* with the mucous surface, and the pouches of the bowel well filled, than in passing the material onwards.

I do not think that this view of the function of the colon is in accord with a very large proportion of everyday practice, and a great deal of the chronic constipation we are here to discuss comes about, to my thinking, because of this divergence. Let me say a word or two more in support. If I am right in the contention that the colon should be *full*, not empty, then an adequate intake of supplies is the first necessity for its health. And this is just what is often wanting. There is much ill-considered talk about people eating too much. No doubt some do eat more than is good for them, but our organs (liver and kidney, and so on) are made nice and roomy to allow for this; and it is quite certain that those who live by strict rule are mostly little better than scarecrows to look at, however herculean

they may tell you they feel. But take by far the largest group of the constipated—it is found in women, especially of the upper classes—and go into their diet. It is so skimpy that they cannot but be empty, and they are expending a great part of their energy upon trying to achieve the impossible—that is, to produce what they consider a good daily output when the colon is empty. In all probability this applies also to the constipation, in part, of old age. Another large class, maybe, eat *enough*, but, having got an ideal of output which they are unable to satisfy, they call themselves constipated, and, as soon as they have had a decent meal, send pills after it to hurry it on, and so they bring about a similar condition. By so doing they create a constipation that would not otherwise exist. The colon, to be happy and contented, must be *full*. It needs occupation, and if, when it is feeding, you worry and distract it by thought or deed and put it out of its stride, no wonder that it knows not which way to turn, and that constipation, mucous colitis, and all sorts of intestinal ailments come into being.

But modern teaching has gone further than the advocacy of the *empty* colon—it has saddled it with a reason for being so, and that reason is a bad one. "Keep the colon empty," it is said, or "do away with it altogether; it is a mere cloaca. It absorbs water, but very little else that is good, and that little is as nothing in comparison with the harm it does as a poison bag." "Exclude it," which means, in plain speaking, cut it out; "you can very well do without it." I am here to-day to hold a brief for the colon. I am one who thinks that the colon is a most important organ of nutrition. There are those here who will bear me out when I say that the contents of the small intestine are never solid, and that from the caecum onwards they at once alter in consistency, and may be solid even in the caecum. The amount of absorption that goes on must therefore be enormous, and I cannot think that the only loss is that of water. But there is another little fact worth a thought. In attempting at autopsies to clear the bowel for the purpose of examining the mucous surface, the contents are often hugged with such tenacity that it is difficult to clean the surface even under a strong stream of water, and much firm smudging with the finger. Often, too, have I felt a similar condition during life when examining the rectum, but this is, I think, sometimes, but by no means always, due to a dry mucous membrane from lack of the proper formation of mucus. These conditions suggest that the colon is a great feeder. So much so that it would seem to clutch its food until the last particle of nutriment be sucked from it. Moreover, an over-gluttony of this kind, if we may suppose such a condition to exist, may in part explain the undue formation of scybala that is found to be present at times, especially so in those mental states to which I have alluded, and where the body is obviously starved into extreme juicelessness and emaciation.

Our tendency is, I think, to picture the colon as a gaping, sacculated tube, inside the abdomen, for the reception and temporary storage of the excreta, and the saccules are by many regarded as evidence of constipation and dilatation. But the saccules are surely an adaptation, as in the lung, that increases the mucous area of the surface, which folds around its contents and in the effort of extracting their juices, squeezes them on slowly towards their output.

Thus it is in the highway that the larger scybala are formed; the little pouches probably account for the pills or "sheep's droppings," as they have been called. When the inspissation is in *excess* these fail of being remoulded in the bowel below, and then the stool becomes an unnatural one.

Thus far as regards absorption. But one must not omit mention of that other, possibly even the greater, function of the colon—its excretory acts, too often viewed to-day in half-lights, as it were. Excretion is no mere *refusal* of certain inappropriate articles of the ingesta; it is in part an *active casting out* of by-products that clog the machine. Can it—not a mere crank here and there—do without this cleansing agency? And is it conceivable that the dog will so early return to his vomit again, as must be assumed if maleficent extrusions are so readily re-assimilated? It would seem that the present opinion, on the one hand, minimizes the value of the colon as thus acting beneficially, and, on the other, over-estimates its powers of absorption in the causation of toxaemia.

There are other points that need to be considered besides the quantity of food necessary for the efficient working of the intestinal muscle—the quality and the variety of food, and all the associated states of bowel, such as spasm and flatulence, all factors in one way or another in the production of constipation. I can, however, mention only one that interests me. It must have occurred to all of us to be told by those who have been treating themselves by a vegetable diet for the relief of their constipation that it has made them worse rather than better. A diet of this kind may act either way. It may, by filling the canal, promote intestinal action; it may, too, by promoting indigestion of sorts, get the bowel into a temper and so induce expulsion. But it is worth while to remember that vegetable food requires longer digestion for its proper appropriation, and I have often thought that when it is associated with more constipation it may be because the colon, as a feeder, is unwilling to pass on the foodstuff until it has been thoroughly exhausted, and thus in a fair proportion of cases may cause delay.

In respect of the treatment of chronic constipation, in discussing first causes thus, the way to deal with them will more or less have suggested itself, but now, and first, this may be said, that it is not every case that needs or ought to be treated. Men and women were not born into this world for the one supreme object of procuring a daily evacuation of their bowels, as so many seem to think. Nor do I believe that "the instinct of death" hovers over those who do not realize this seemingly revivifying hope. It is obvious that, although we have no certain knowledge of what Adam did, a habit has been gradually formed that largely owes itself to convenience. But some there are, nay many, whose natural rhythm is a two or three day one. Even a weekly interval is by no means so very phenomenal, without ill health; and, personally, I make bold to affirm that there is many a one with a small appetite who would be in much better health if he or she accepted a habit of some days' interval and kept themselves meantime unharassed by aperients. There are many *constipated* who are *very healthy*, and there would be thousands more so if, instead of assuming disease because they are constipated, they called themselves healthy and ceased to self-centre. And this large group seems to me to hit hard the doctrine of intestinal auto intoxication. Carried to the extent that it has been of late years, I cannot but think it unsound and baneful. I will go further, and say that the treatment of the supposed condition by so-called intestinal antiseptics has seemed to me decidedly inconclusive; and as to surgical measures for its relief, based, as I believe them to be, upon unsound principles, except for the relief of quite occasional organic results, they are destined to fall into oblivion. I quite admit that "the intestinal flora," as I see is the vogue just now, may not be all that is desirable, but in the neighbourhood of a stercorin factory one can hardly expect the wilderness to blossom as the rose. Nay, more, if it were to do so, one might confidently predict that the departure from the normal would be so wide that death would be lurking in the bushes.

When treatment is necessary it is of importance to bear in mind that although we have drifted into the routine of aperients of one sort or another, each case needs to be considered on its own merits, from a physiological standpoint; and if so, many will be found where simple rules and a little patience together will suffice.

For instance, a large number are obsessed with the necessity of a daily stool of certain proportions, and that if this is not effected a block, as it is termed, appears upon the near horizon. For such the simple maxim "never look behind you" will often suffice. No doubt the sight of a diurnal evacuation of cylindrical proportions is an objective evidence of health, as a man learned in the law once said, and it carries comfort and even happiness to many a wistful heart. But there are other thousands who, looking to procure their daily bread of confidence, are disappointed with the result, and what then? They go away discontented, suppose themselves constipated, and slide into the curse of pill taking. We must bid these people remember that there is a meaning in the fact that the rectal nerves are gourmets; that they are endowed with a palate for *quality*, but that they are but poor judges of *quantity*, and thus it is that the *uncentred* man will often pass a copious stool when it has seemed a little

one, and a little one when it has seemed a big one. The differentiations made by our rectal sensations seems to me to be a very valuable asset. It is thus that so many people who are not constipated within the meaning of ill health, pass on into the habit of taking aperients, and by thus keeping the colon *empty* bring on the very fault they strive to cure. It is often urged as an objection to the use of castor oil that it makes for constipation afterwards. This is a fact turned the wrong way. The complaint is a real testimony to the worth of the drug, for it shows that the colon has been emptied so completely that, until it has filled again, there is nothing to come away. All colonic aperients in proportion to the thoroughness of their service make for subsequent constipation, and may it not be that the universal use of aloes as an expulsive is a sort of unconscious testimony to its value, as on the whole tending to leave the colon alone, and expend its energies upon the *rectal qualitative centre*.

For that large group of cases where the fault is really that of starvation, they need to accept the advice given to St. Peter, and call nothing common or unclean. A more generous and varied diet—more fat, more water—will help them back to health. In such cases, too, the various juices poured into the canal are poor in quality and deficient in quantity, the mucous membrane being dry and irritable, the muscular force erratic, and griping. These maybe are cases for salines to encourage secretion, and for tonics and antispasmodics, such as belladonna and so forth. While for purely sluggish conditions of the colon, when they exist, and for the lessened impulses of decadence, some mild stimulant—even of the pepper class—may sometimes be useful, and even necessary. In this class of cases, also, massage and electricity find their use, as inciting the *vis a tergo*, while enemata come in as local rousers for the purpose of clearing the collecting chamber.

In thus dealing with my subject, I have more than a suspicion that many who have listened may have thought "this is all very well, but it is not business"; and I must now confess that—persuaded though I be that I have said the right thing, and that it needed saying—I am too often almost in despair when dealing with one who, having tried all the aperients that were ever heard of, even down to the very latest boom, it may be of sour milk, is still asking for something fresh. He or she and I could hardly be farther apart in thought and intention, and often have I wished that, like our present Prime Minister, I had aplomb sufficient to rigidly confine my utterances to "Wait and see." I know of course too well that in the life that advancing civilization seems compelled to lead, aperients will be always with us; my lament is that we have so far diverged from the wisdom of our forefathers with their *occasional* "tuto, cito et" (let us hope) "jucunde" into a chronic niggle that is none of these. But how to make this bad habit better, or at all events as little baneful as possible, I leave to those who follow me.

DISCUSSION.

Professor Bäumler (Freiburg) said that on the whole medicine might be regarded, in respect to the matter under discussion, as emerging from crude empiricism into the stage of scientific clearness, thanks to experimental physiology and clinical investigations based thereon. Of the greatest help for the latter had been the observation of the motor processes in the gastro-intestinal canal by the aid of the Roentgen rays with the bismuth method devised by Cannon. By means of this method of observation it could be ascertained in any individual case whether the ingesta left the stomach and travelled along the intestine in the proper time, and whether constipation was due to a want of motor power in the intestine, or to a mechanical impediment to the passage of its contents, or to some defect in the complex function of the rectum which brought about defaecation. Dr. Hertz had admirably cleared up this side of the question and done away with many errors which had prevailed until recently. One point of particular importance was the revelation that not only in elderly people or those with definite enteroptosis, but also in young people with good abdominal muscles, the transverse colon sometimes hung down below the navel in the shape of a garland. Another point demanding consideration was the great influence of sleep over the tone of the sympathetic nervous system. This, as was shown by the experimental work done by Dr. Langley, Drs. Bayliss and Starling, commands by reflex and automatic action the movements of the bowels. And just as on the vasomotor part of the sympathetic nervous system a loss of tone showed itself in the state of capillary circulation in the face and elsewhere, so it showed itself in its intestino motor part by impairment of the normal motion of the intestinal contents, including their expulsion from the pelvic colon into the rectum. His advice to a patient would be to eat enough of a plain mixed diet with a sufficient quantity of vegetable food, to sleep enough, to take regular exercise and a cold bath in the morning—a most excellent tonic for the sympathetic nervous system—and generally to put to use the experience which he had acquired regarding the influence of various kinds of food by trying regularly and at the proper time to empty his bowels. It was an old saying, with regard to this and some other matters, that a person of 30 or 40 years ought to be his or her own doctor. If he was not, let him apply to a conscientious doctor, who had experience in medicine generally, and who was not a mere specialist. If such a medical man found something beyond his understanding or his powers of treatment, especially surgical treatment, he would call the specialist or the surgeon to his assistance. To young medical men he would say, "Examine the patient carefully, try to form a correct diagnosis on which to base your treatment, keep always in mind the great powers which the organism possesses to correct deviations from the normal functions, if only it is given time to do its work by itself without interference and constant tampering by medicine or by some systematic cures." Such may be necessary in certain cases, and if a patient could not guide himself in this as in other matters, if he required props of various kinds, then he should be sent into a clinic or sanatorium, where the complicated machinery of his gastro-intestinal organs could be examined and where appropriate means could be devised and carried through according to what was found.

Sir James Sawyer (Birmingham) said constipation was retarded progress of faeces from the caecum to and through the anus. In a conception of habitual constipation must be included the fact that human faeces consisted in great part of matters excreted by the glands of the intestinal mucous membrane, as well as of insoluble and superfluous food, mixed with intestinal mucus and pancreatic and biliary excretions. The physician recognized both these factors, while heroic intestinal surgery contentedly contemplated the dietetic effluent only. The errors of habits of life, of alvine effort, and of diet, which caused constipation, were known to medical men. In their persistent rectification lay the cure, without drugs, of most of the slighter forms of costiveness. In those severer cases in which drugs and even instrumental aid could not be avoided, all that well ordered habits, well directed efforts, and well-chosen diet could accomplish, were indispensable adjuvants of physicking. In the treatment of habitual constipation there were three canons: (1) The medicinal treatment of constipation should not be left to patients. (2) Drugs, in the treatment of habitual constipation, should not be prescribed until it was found that the constipation could not be cured without. (3) Drugs should not be prescribed without the judicious combination of the numerous adjuvants of natural alvine relief at disposal. These should be selected according to experience, and combined in each particular case of costiveness, according to the individualties of the patient. None but a skilful prescriber could treat constipation successfully. To open the bowels cured not constipation, but only relieved for a few hours one of its symptoms. The second of these canons—that of withholding drugs until drugless methods failed—was a counsel of perfection which was wise in its aim, and should be followed generally; but the insistence of patients for a purgative dose was proof that patients were sometimes right in this matter (*fas est ab aegro doceri*), and that a cathartic might give a fair start for a cure by disciplinary and dietetic methods. In costiveness therapeutic clues arose from an old definition of it—namely:

> In constipation the faeces are hard, and may be retained from that cause, from weakness of the muscular coat of the large intestines, or from diseases of the anus, making defaecation difficult or painful.

Habitual constipation was a penalty of imperfect civilization,

and due to habitual abstinence from emptying the rectum whenever the natural impulse thereunto was felt; to habitual defaecation when seated upon a high seat; to habitually diminished activity of the psoai and iliaci; of the respiratory muscles, and of the muscular fibres of the large intestines, or to habitual abstinence from fruit and their likes. Each of these causes was avoidable and should be avoided before a drug was taken for the cure of habitual costiveness. If the avoidance of these causes was not curative the avoidance should nevertheless be continued when drug treatment commenced. By habit in health the act could become to some extent a rhythmical process, occurring at a fixed time, each twenty-four hours. Perhaps the best time was after breakfast. But before bed was the best for those with piles—defaecation strained and protruded piles, and the horizontal rest of a night in bed procured haemorrhoidal subsidence. Chosen the time, the voiding effort should be made daily, at the usual time, whether the need to defaecate be felt at that time or not. Besides this, defaecation should always be attempted whensoever the local urgency. By putting it off the rectum emptied itself, if it could, into the sigmoid flexures, and habitual constipation was caused and kept up. Perhaps this holding up of returned faeces in the sigmoid flexures might be a determinant of cancer there. Cancer there was much more frequent in men than in women. Women were more likely to neglect to try defaecation at a rhythmical time, but men put off the act more than women do. Men liked to defaecate at a fixed time, and at no other time. Habitual costiveness was more frequent amongst women than amongst men, from irregularity in the time of alvine effort, from procrastination therein, from feebleness of the muscular factors of defaecation, from the wearing of waistbelts, of "stays," and of corsets, and from inimbition. The best position of the body for defaecation was the natural one in crouching. Then the parts acting in the voidance of faeces were in the best position for doing it. Failure of defaecation upon the usual seat, eighteen inches high, would often issue successfully if the effort be renewed forthwith in the physiological attitude. Certain faulty and habitual postures of the body favoured a faecal sluggishness; namely slouching, stooping, and especially that form of arching backwards the lower spine and doubling up of the belly, when sitting "all in a heap" in a large and low easy chair. Such habits were declared by transverse wrinkles in the epigastric skin. This posture hindered movements in the belly contents in many ways. It tended to the production of two more angles in the greater gut, one in the ascending colon and one in the descending colon, by an antero-posterior bend on each side, below the hepatic and splenic flexures respectively. Daily bodily exercise, especially out of doors and in sunshine, favoured alvine normality. In habitual constipation further helps might be given by exercises which promote biliary flow, such as respiratory movements, those bringing into play the muscles of the abdominal walls, and by those which promote movements of portions of the large intestine in which faecal stagnation was most apt to occur, that is, in the caecum and in the sigmoid flexures, for which last the psoai and the iliaci must move well, as in running upstairs two steps at a stride, or as in "knees up" exercises. The best diet in the cure of costiveness was a mixed diet. If, with such a diet, habitual constipation did not yield to habitual and suitable alvine effort, aided by suitable physical exercises, then food of a laxative tendency, that is, foods full of cellulose, should find place in the dietary or be increased therein—cooked green vegetables, fruits, fruit jams, and, chiefly, marmalade of oranges. Among purgatives, if these had eventually to be used in a case of habitual constipation, a good one was aloes. Myrrh, aloes, and cassia would still make the Coprostatic glad. Myrrh, with its old repute of "giving an impetus to the digestive organs, and an increase of muscular power to the intestinal canal," Socotrine aloes, and cassia pulp, of each a grain and a half, made up into a pill with castor oil, of which pills one or more at bedtime, as found to be needed, with a gradual reduction and omission of them so soon as possible. No case of habitual constipation could be cured by rule of thumb. Each must be investigated in all its details and relationships.

Dr. H. D. ROLLESTON (London), whilst agreeing with the importance of avoiding an exaggerated view of constipation, its sequels, and of the necessity for treatment, considered that the results of intestinal autointoxication must not be neglected; their influence in inducing visceral changes in the liver and pancreas, in the etiology of arterio-sclerosis and other diseases, was too obvious to require detailed consideration. The personal factor was most important with regard to the production of symptoms by constipation; some patients were unaffected by constipation, even of weeks' duration; others suffered severely; in some nervous subjects mucous colic seemed to be a direct result of constipation. It was impossible to discuss the subject in its protean aspects, and he proposed to say a few words only on the following points: (1) Want of tone in the muscular coats of the intestine, the result of nutritional, toxic, and nervous factors. In these cases tonics such as strychnine were of value. In connexion with this he referred to cases of benign hypothyroidism in women in which thyroid given for other reasons was found incidentally and, so to speak, accidentally to relieve constipation. A valuable means of re-educating the atonic colon was washing out the bowel by large enemas, as in the Plombières treatment. (2) Excess of tone; spastic constipation, particularly in nervous subjects, was sometimes due to some source of reflex irritation in the abdominal cavity; these were the anomalous cases in which rest in bed relieved constipation whilst exercise aggravated it. In these cases belladonna sometimes had a good effect; he quoted cases in which minute doses of opium had been successful, it was thought, by counteracting inhibitory influences on peristalsis (Brunton), and others of malignant stricture in which ½-grain doses of opium acted as a violent purge (Rouse). (3) Diminished secretion of intestinal mucus and insufficient intake of fluid. The treatment of such cases was universally recognized to be increased intake of fluid. Lubricants and oil and remedies such as regulin were also employed, but vaseline had not given good results in his hands.

Dr. G. NEWTON PITT (London) said that knowledge of the mechanism of defaecation and of the way in which the food passed down the alimentary canal had greatly increased in recent years through the study of the process by *x* rays, after the administration of 2 oz. of bismuth carbonate or oxychloride. In this country the researches of Dr. Hertz had been of great value. It was now known that the intestinal results of each meal should reach the caecum in about four hours, and be passed on and packed away in the descending colon and the sigmoid in eighteen hours. Normally the rectum should be empty except during defaecation, in which case both the descending colon and the sigmoid should contract vigorously and eject the whole of their contents through the rectum. This being the case, it is easy to understand how a tender kidney or ovary or a flaccid abdomen might disturb the process. It would also explain the not infrequent cases in which a patient had two or three motions within an hour, and then none for the rest of the day. If the normal stimulus to the act were ignored, the imperfection of the later muscular contraction can be demonstrated by means of bismuth. It is only recently that sufficient cognizance had been taken of the fact that on an ordinary diet only one-third of the faeces consisted of food débris, while one-third consisted of bacteria, dead or alive, and one-third of intestinal epithelium and secretions. The amounts varied with the diet—in many cellulose would increase the first item, but in others the food débris was very small. So also the last factor varied greatly. Some intestines seemed capable of doing their work with the production of very little waste products. It was curious that the amount of bacteria was least with the habitually constipated, and the defect might be a cause of the constipation. In many the greater part of the faeces depended more on the condition of the intestine than on the diet. Hence the effects of the constipation varied greatly in different individuals. When the habits were extremely regular, the slightest delay, of even half an hour, led to great discomfort, and retention for a moderate period even, might lead, especially in children, to pyrexia, foul tongue, and toxaemia. In those habitually constipated, and whose bowels acted at longer intervals than one day, there need not be any toxaemia or discomfort. In many such patients the discomfort occurred on the days when the bowels acted, and they felt well when the bowel was quiescent. Indican was often absent from the urine of those whose

bowels acted at long intervals, and might occur with quite slight degrees of retention. The speaker had known patients who were most comfortable when their bowels acted once in two days; others when the action was once a week, and a few when the interval was a month or more, and any attempts to produce daily action upset them. While in early cases much might be done by regulating the diet and the habits, the existence of these other cases must not be ignored. The association of constipation with melancholia must not be ignored, and during the stage of mental depression no drugs would prove effectual, but with the return to a normal mental condition the bowels would become regular. That the most active absorption goes on in the large intestine was well shown in a case of chronic lead poisoning in which the small intestine was of normal colour, but the whole of the large intestine was very dark from the presence of lead sulphide in the wall of the colon. In some cases, especially in women, the constipation was due to defective intake of liquid, in others to defective amount of faeces, and these latter were relieved by giving liquid paraffin or agar-agar to increase the bulk. In conclusion the speaker related the following case:

The patient was a woman, aged 23, who had been under his observation for the last two years, and who had been three months at a time without a proper action of the bowels. The trouble dated from an attack of diphtheria at the age of 18, since when she had not passed normal motions. At intervals a loose blackish fluid could be washed out of the bowel. The abdomen did not become distended, the rectum was empty, and the food could be shown to pass down to the caecum in the normal time, and generally also there was no delay till it reached the sigmoid flexure. All sorts of diet, laxatives, and enemata had been tried without much success. A very slight action could be obtained generally once a week with an enema. The woman ate a normal amount of food. At Christmas, 1908, she was given 12 grams of agar-agar to increase the bulk of her faeces. Later, when 25 grams of regulin were given, she had severe intestinal colic, with vomiting and profuse perspirations, and her temperature ran up to over 111 F. She recovered her normal condition when it was stopped. From time to time there was a period when occasionally fair-sized motions were passed. Between July and September, and again between September and November, 1909, there was practically no action of the bowels; only a slight staining of the water of the enema given once a week was detectable as a rule, with occasionally minute fragments of débris and skins. The total amount was not one-twentieth to one-fiftieth of the normal. She was kept in bed and carefully watched, and there was no evidence of any deception. When 50 grams (2 oz.) of bismuth was given in December, 1909, practically the whole was collected later from the faeces; of 56 grams taken on January 16th, 1910, only 2·5 could be obtained from the faeces by February 3rd; and of 56 grams taken on February 23rd, 23.5 were recovered on February 26th with a copious motion. The explanation would appear to be that the patient produced a remarkably small amount of faeces.

Mr. W. ARBUTHNOT LANE (London) said that constipation was a symptom, and the most common symptom, of intestinal stasis as affecting the large bowel. By intestinal stasis he meant such a delay of the contents of the intestine in the gastro-intestinal tract, but more particularly in the large bowel, as allowed of the absorption in the circulation of a larger quantity of toxic material than could be dealt with effectually. This delay was brought about by an alteration in the arrangement of the drainage apparatus. In early life it resulted from an abnormal distension of the intestines by too frequent feeding, or by the use of unsuitable articles of diet. Later it was produced and accentuated by the erect posture of the trunk. The changes were primarily mechanical and secondarily toxic. The mechanical were: (1) Kinking of the pylorus by the development of a new ligament which attached it, and frequently a portion of the transverse colon, to the under surface of the liver in front of the transverse fissure, and frequently to the cystic duct and gall bladder, interfering with their normal functioning. (2) A dilatation of the stomach consequent on the kinking of the pylorus. (3) The development of areas of engorgement of the mucous membrane of the first part of the duodenum and of the lesser curvature on either side of the attachment of the acquired ligament. (4) The formation of an ulcer at a later period in these areas of engorgement. The ulcer in the duodenum readily reacted to treatment by rest, while that in the stomach was much more chronic, and on that account became infected with cancer or other germs. (5) The development of a kink in the ileum within two or three inches of its termination. This was associated with a dilatation of the entire small intestine. This dilatation was frequently very marked in the duodenal area of the small bowel. (6) Fixation or kinking of the appendix, producing the several conditions comprised under the term "appendicitis" (7) Dilatation of the caecum, which usually occupied the true pelvis. (8) Kinking of the hepatic and splenic flexures. (9) Occasional kinks of the ascending and transverse colon. (10) The transverse colon was placed at an abnormally low level, part of it frequently in the true pelvis in the erect posture. (11) The sigmoid was subject to great variations with its fixation by acquired bands and mesenteries. If the process was complete the loop was obliterated and replaced by a short, fixed, straight, narrow tube through which faeces were driven with difficulty; or the ends of the loop might be fixed and approximated and result in a condition called volvulus; or the loop, besides being attached by its extremities, might be interrupted by an intermediate fixation and two so-called volvular arrangements resulted. There were other variations. (12) The development of the adhesions and mesenteries which fixed the lower part of the sigmoid and upper part of the rectum anchored the left ovary and appendix and dragged them out of place. This anchoring resulted in the fixation of the ovary and later in its cystic degeneration. (13) The condition of the rectum varied very greatly. The general tendency was for it to elongate in direct proportion to the fixation of the colon. The more effectually the rest of the large bowel was fixed by adhesions the greater was the elongation and mobility of this portion of the bowel and the less capable was it of performing its normal function of transmitting the faeces at a mechanical advantage. (14) At any point of stress in the large intestine areas of abrasion and ulceration of the mucous membrane might occur and produce abscesses in the vicinity, especially in the fixed sigmoid or rectum. These areas might later become infected with cancer or other germs. (15) The stasis in the stomach and in the small intestines produced most definite clinical symptoms. Associated with the latter especially there was a considerable ascent in the level of deleterious organisms in the small bowel, with occasional infection of the biliary and pancreatic drain pipes producing gall stones, pancreatitis, and later cancer of the structures. How great a part was played in the production of gall stones and pancreatitis by the direct infection of the ducts from the intestine and by depreciation of the resisting power of the organs and their secretions by autointoxication was difficult to determine. The speaker had no doubt that one or both factors brought these changes about, and that mechanical interference with the functioning of the gall bladder and duct by adhesions might facilitate the formation of gall stones. It was well to bear in mind that the deleterious organisms of the intestine readily migrated through the blood stream—as, for instance, to the genito-urinary tract in both sexes, from which they were expelled with the greatest difficulty, while not infrequently they were ineradicable. (16) Constipation was chiefly associated with stasis in the large bowel and was more marked the lower the area of stasis. In some localities diarrhoea might result from the stasis, or constipation might be replaced by periods of diarrhoea. Or, again, definite infections might result in an inflamed condition of the mucous membrane of an acute or chronic character. Besides the symptoms resulting from the mechanical interference with the normal functioning of the intestine those resulting from autointoxication were of vital importance, not only in ageing the individual, but also in reducing the resistance to the entry of organisms of various sorts into the tissues. Among them was loss of fat, with its innumerable very serious consequences, the mental misery, the complete physical and mental disability, the staining of the skin, the loss of the appetite, the marked alteration in the respiratory and circulatory system, the cold clammy skin, the degenerative changes in the breast which might sooner or later become infected with cancer, infection of the gums, decay of the teeth, the development of tubercle, rheumatoid arthritis, etc., and all the symptoms generally comprised under the term "indigestion." Life to these people had no attraction. These symptoms could be relieved by the removal of the factor which determined them. In some cases a gastro-enterostomy, in others the division of the ileal or other kink, in others the removal of the appendix, in others the division of the ileum and its connexion with the rectum

as low as possible, and in others the removal of the large bowel was called for. These operations could be done at a risk ridiculously small considering the miserable physical and mental condition of the sufferer, and which would be still further reduced with increasing experience. The relief afforded was out of all proportion to the risk. In the year ending June, 1910, the speaker had operated for constipation at Guy's Hospital on 15 patients, dividing the ileum and putting it into the rectum in 4 and removing the large bowel as well in 11 cases. He had lost only one patient, and that through an accident.

Dr. Mantle (Harrogate) said they had heard very much of the happy side of constipation. It was his experience, not from any choice of his own, to see the unhappy side, for he had a large number of cases of chronic constipation and colitis sent to him for treatment at Harrogate. Little had been said about the local effects of faecal accumulation in the colon, for catarrhal inflammation was not infrequently set up with an abnormal secretion of mucus. Mucus when normally secreted was invisibly mixed with the faeces, and when seen in large quantities was abnormal. He had several cases of colitis under treatment at the present time which had been operated upon for appendicitis. The appendix had been removed, and the symptoms of constipation and colitis remained; they undoubtedly existed long before the appendicular operation took place, the appendix having been affected by extension of the colitis. Sir Frederick Treves had pointed out colitis as the cause of failure of the operation for appendicitis; and he had also said that if they had less constipation they would hear less of appendicitis. Autointoxication was a reality; he wished he could think otherwise; although there were lines of defence against the absorption of toxins in the cells of the mucosa, and in the antitoxic function of the liver and kidney, yet when one or all of these defences were weakened, symptoms arose, and he believed that the nervous and circulatory systems suffered most. The toxins had a special affinity for the vasomotor centres, and there was a loss of balance of the circulation—too little blood in the extremities, with cold extremities, and too much in the splanchnic area, which aggravated the bowel disturbance, and frequently gastric symptoms and gastric dilatation were present. Arthritis was not uncommonly produced by the toxins, and these cases were rightly or wrongly called rheumatoid arthritis. He found such cases improve in a marvellous way with intestinal lavation, combined with other treatment. He also pointed out that skin manifestations were not uncommonly traceable to toxin absorption in chronic constipation, and in the *Lancet* of that week he was publishing a series of cases of eczema, psoriasis, and chronic urticaria successfully treated by colon lavation. The treatment adopted at Harrogate was the washing out of the colon with 30 to 40 oz. of sulphur water, which very soon, in most cases, produced a better condition of the mucous membrane, and this was followed by an immersion bath of the same water, which opened out the peripheral circulation. Massage to the colon and electricity were also resorted to, as well as attention to diet, green vegetables and fruit being recommended. New habits should be formed, for this was an important factor in treatment of many of these cases. He strongly deprecated the pernicious habit of aperient drinking, for undoubtedly this was on the increase as a short cut to a daily evacuation, which ought to be accomplished in a natural way.

Dr. Arthur F. Hertz (London) said: For the rational treatment of a case of constipation it is necessary to know what part of the alimentary canal is at fault. I have found by means of the *x* rays that the undigested residue of a meal passes through the small intestine in approximately four and a half hours, and through the colon in twelve hours. Having once reached the pelvic colon it remains there until the act of defaecation expels the contents of the whole of the large intestine beyond the splenic flexure.

All cases of constipation can be divided into two groups. In one there is delay in the passage of faeces through part of the colon, and occasionally through the small intestine; in the other, to which I have given the name of "dyschezia," the faeces reach the rectum in the normal time or even with unusual rapidity, but their expulsion is difficult or impossible owing to weakness of the muscles of defaecation or impairment in the defaecation reflex. For the former group of cases treatment by diet, massage, and drugs will probably be successful; in dyschezia these are only useful in so far as they make the faeces softer and easier to expel, the more important means of treatment being re-education in regular habits, the assumption of a squatting position during defaecation, exercises for the abdominal and pelvic muscles, enemata, and suppositories.

In constipation due to errors in diet, the effect of giving food which is greater in bulk and in chemical and mechanical stimulants to peristaltic activity, is to hasten the passage through all parts of the alimentary canal, but especially the colon.

Massage is of great value, if it be applied to the part of the colon in which delay occurs; the reason why it so often gives disappointing results is that it is applied to parts of the bowel which are already working well, or to a part of the abdomen in which the colon is not situated at all. Palpation can sometimes give information as to where the massage should be applied, but accurate knowledge of the position of the colon and of the region in which delay occurs can only be obtained by the use of *x* rays. The contrast between two cases, *x*-ray pictures of which I throw on the screen, demonstrates how necessary it is to individualize in treatment. The first shows the position of a colon in which delay occurred in the distal part only; it is clear that massage should be applied in such a case to as much of the second part of the transverse colon as could be reached and also to the descending and iliac colon. In the second case the delay occurred only in the ascending colon and proximal half of the transverse colon. These parts were dropped far below their normal position even when the patient was examined lying down. In this case massage applied to the part of the abdomen in which the colon is generally situated would be useless, but if applied along the ascending and transverse colon, as localized by the *x* rays, it would be of great value.

As most of the nutritious part of food is absorbed in the small intestine, and as any considerable delay very rarely occurs in this part of the bowel even in severe constipation, treatment should be directed to hastening the passage through the colon without interfering with that through the small intestine. It is for this reason that diet and massage, which act mainly on the colon, are preferable to aperients, the majority of which act equally on the small and large intestine. (The effect of a dose of cascara, which was just sufficient to produce a single soft and bulky stool a day, was here shown in a series of *x*-ray tracings.) The rapid passage through the whole alimentary canal must result in a considerable loss of nutritive material. It is therefore essential to order the smallest dose of an aperient which will give a daily formed stool, and to instruct the patient to diminish the quantity used as improvement in the condition of the bowels occurs.

If for any reason it is desirable to produce a very soft stool, saline aperients should be used, as the experiments I have carried out with Messrs. Cook and Schlesinger show that sodium and magnesium sulphate completely empty the large bowel without hastening the passage through the small intestine.

In the very rare cases in which all other methods of treatment have failed to give relief and the patient is suffering severely from pain and autointoxication, the question of operation has to be considered. In several of the worst cases of constipation I have seen the colon was normal in size, shape, and motor power, dyschezia due to paresis and anaesthesia of the rectum being the sole cause of the symptoms. It is clear that in such cases no operation could help, as the colon was performing its functions quite efficiently. After dyschezia has been excluded it is necessary to find what part of the large intestine is at fault; frequently the mischief is quite local, and in such cases it would clearly be unsound treatment to do such a radical operation as ileo-sigmoidostomy or colectomy. In the only case I have yet seen in which all non-operative treatment failed to give relief I found that the passage of faeces was normal as far as the middle of the transverse colon, but beyond this point delay was extreme. The transverse colon fell into the true pelvis when the erect position was assumed, so on consulting with Mr. Steward we decided that a lateral anastomosis should be made

between the most dependent part of the transverse colon and the pelvic colon.

At the operation Mr. Steward found that, in spite of all the efforts which had been made to empty the bowels before the operation, the distal part of the transverse colon and the descending colon were packed with small and very hard scybala, and that the wall of this part of the bowel was greatly atrophied, the remaining part being normal. After the operation, *x* rays showed that about three-quarters of the faeces passed through the lateral anastomosis into the rectum. An interesting point is that the short-circuited part of the bowel is able to deal quite efficiently with the small quantity of faeces which still passes through it. This shows that a lateral anastomosis acts as well as an excision, so long as the short-circuited part of the bowel is not excluded by cutting across the proximal segment of the bowel.

Dyschezia is a much more common condition than is generally believed. It not only occurs in women who have weak abdominal muscles and injured pelvic muscles as a result of many pregnancies, and in old and enfeebled individuals, but it is frequent among girls, who for various reasons have not obeyed the call to defaecation with sufficient promptness, and so have impaired the sensibility of their rectal mucous membrane, and lost the normal defaecation reflex. I have even seen it in athletic and otherwise healthy young men who had neglected to give sufficient attention to their bowels. These cases, in which the defaecation reflex is impaired, can be readily cured with the patient's intelligent co-operation. All aperients should at once be discarded. An attempt to defaecate after breakfast should be made, even if, as is generally the case, no desire is felt. When the attempt is unsuccessful or only partially successful a glycerine enema should be given. This affords the necessary additional stimulus to the defaecation reflex. On alternate days the glycerine should be more and more diluted, and the bulk of the injection diminished until natural defaecation without artificial help returns.

In the treatment of dyschezia it should be remembered that the ptosis of the colon, which is frequently associated with it, does *not* cause constipation by producing kinks; both the dyschezia and the ptosis are due to weakness of the abdominal and pelvic muscles. In such cases an abdominal belt, though it gives comfort by increasing the intra abdominal pressure, and though it helps the weak abdominal muscles to recover their tone, rarely if ever holds the dropped colon in position. This was well seen in the case of the patient on whom Mr. Steward operated. Although her transverse colon was only just below the umbilicus in the horizontal position, the *x* rays showed that an excellently fitting abdominal support applied whilst she was lying down did not prevent the transverse colon falling into the true pelvis as soon as she stood up.

Finally, I should like to refer to the important condition of pseudo-constipation, in which the patients are obsessed with the idea that their bowels will only open with the aid of aperients or enemata; to this is often added—particularly in medical men—the obsession that they have all manner of adhesions, kinks, and strictures of their bowels. To several of these I have given relief by demonstrating to them with the *x* rays that, even when they take no medicine, the passage through their bowels is normal in rate, and that their colon is not fixed by adhesions and has no kinks and no strictures. The picture thrown on the screen is from one such patient, who was hesitating between suicide and colectomy when he was sent to me by his doctor. He took no medicine during the series of *x*-ray examinations, the result of which was to show that his colon was in every way normal. Rectal examination twenty-four hours after the bismuth meal confirmed what was seen with the *x* rays, that the bismuth had already reached his rectum. Protesting that it was quite impossible for him to get his bowels opened without large doses of aperients, he was persuaded to try at once; his attempt was successful. The same thing happened the next day. Whether he will remain convinced that he is not constipated I do not know. Some of these patients are permanently cured; a few, in whom the obsession has almost reached the dignity of insanity, cannot be persuaded, and continue taking their pills and their injections until their bowels at last revolt against this perpetual ill usage and become genuinely diseased.

Dr. William Ewart (London), referring to the mechanism, pointed out that fullness with faeces was perhaps not so important as the proper amount of fullness with gas. He regarded the caecum as the air-pressure chamber, and its abnormal deflation as answerable for some of the cases of constipation. As regards tone and atony, did they ever hear of constipation in the labouring man? They heard much of it in women with deficient physical work. This opened a physiological consideration. The training of the function of strain was provided for in man by the constant practice of muscular work. In women constipation was constitutional—nay, physiological. It might be regarded as given to them as a constant education for the ordeal of parturition.

Dr. George Herschell (London) said there was a simple method by which the general practitioner, who had not access to a radiographer, could diagnose the two groups of constipation enumerated by Dr. Hertz, namely, delay in colon or sigmoid respectively. It was by giving a test meal in conjunction with a dose of carmine. If this was found in the stools next morning the time of transit was normal. If the stool passed with no carmine, the delay was in the upper colon. If no stool passed a small injection was given, sufficient only to empty the sigmoid. If this brought away carmine-coloured faeces the delay was in the sigmoid. He was astonished that, with the exception of Drs. Rolleston and Mantle, none of the speakers had alluded to colitis in connexion with constipation, as it was one of its most constant concomitants either as cause or effect. Colitis was indeed a stage in the evolution of an ordinary case of atonic constipation. The first stage was atony, the second, colitis, was set up by the irritation of retained faecal matter, the third was a hypertonic condition of the intestinal muscularis, producing the so-called spastic constipation. As later stages there might be muco-membranous colitis, etc. The diagnosis of chronic colitis depended upon the examination of the stools, which contained an excess of inorganic ash, mucus, not necessarily in large amount, a relative excess of Gram-positive organisms, in many cases attended with putrefaction, and a condition in these cases of alkalinity. No reference had been made by any of the speakers to the use of olive oil injection in the treatment of constipation, especially of the spastic form, in which it was the most reliable remedy. In these conditions purgatives were contraindicated, but instead, injection every night of a few ounces of warm olive oil, which should be retained all night. No mention had been made by any of the speakers of the use of the sigmoidoscope in the diagnosis of constipation. In all cases mechanical causes should be excluded, and they could be excluded by its aid, and they had no right to prescribe until they had done so. In the case mentioned by Dr. Goodhart, in which every kind of pill had been tried without effect, either some mechanical condition was present or some colitis would have been found if a proper examination had been made. None of the speakers had alluded to proptosis of the left broad ligament as a common cause of constipation in women. This cause had been worked out by Miles, who recently presented his results to the Chelsea Clinical Society. The symptoms were left iliac pain, abdominal flatulence, gastric disturbance, and in many cases mucous colitis. In 150 cases in which Miles operated by obliterating the ligament cure resulted in all except two.

Dr. Guelpa (Paris) said that although he acquiesced in the majority of Dr. Goodhart's views, he would ask permission to add some words to defend the theory of intestinal auto-intoxication, so unjustly condemned by him. It seemed to the speaker that Dr. Goodhart's analytical conception of the causes of constipation had made him lose sight of the *primum movens* of those to which he attributed the origin of this pathological process. Certainly these causes were true, but if an attempt was made to consider what had produced the pain, starvation, disturbances of peristalsis, secretion, absorption, excretion, etc, rightly attributed by Dr. Goodhart to the perverted nervous element, it would be found that these nervous, sensory, motor, and trophic modifications were determined and supplied by the intoxication—chiefly by the auto-intoxication—which acted, directly or indirectly, especially by the nervous tract, on the intestinal functions. This

was proved by the fact that the disorder of these functions, after a short apparent increase, was quickly ameliorated and almost always cured if the patient would submit himself during two, three, or even more days to absolute privation of food, associated with daily purgation. These favourable results occurred because the digestive system was afforded the maximum of rest and disintoxication, and thus allowed to recover its healthy sensibility—the consciousness of its functions. Without the supply of any medicament, merely with the help of an appropriate belt, which corrected the frequent defects of the abdominal statics, and keeping the patient for a certain time to the liquid and semi-liquid diet, after these repeated periods of rigid treatment, the drawbacks of constipation usually disdisappeared. It was unnecessary to say that this assertion was only true when there was no question of constipation dependent on organic lesions, medically incurable (fibrous adhesions, tumours of the brain, cancer, tuberculosis, etc.). When the speaker used purgation it was not for the purpose of producing regular evacuations, but only to hasten the disintoxication effected by the privation of food. Repeated purges without protracted and simultaneous privation of aliments increased the constipation with all its unfavourable effects.

Dr. Stuart Tidey (Montreux) said that constipation was so common as to be almost universal among all classes of people who lived under conditions of close social aggregation—master and man, mistress and maid, shopkeeper and waitress, the concierge and the lift boy—all suffered with constipation. The less gregarious and the more isolated the life of the individual, the less did he suffer with constipation, while the peasant whose life was passed in the pursuit of isolated outdoor occupations performed his intestinal function in a normal manner. This difference in the performance of the intestinal function depended on the different amount and kind of exercise, on differences of diet, or on the isolated as distinguished from the gregarious life. In the first place, there was, in his opinion, no exercise, not excepting golf, more conducive to the maintenance of the tone of the abdominal and intestinal muscles than those involved in agricultural pursuits. In the second place, the ordinary food of the peasant contained a good quantity of fibrous and indigestible matter, forming a bulky mass, which stimulated the intestine to contractive effects, and afforded a substance on which the bowel could contract with effect. In the third place, isolated outdoor pursuits permitted the timely escape of intestinal gases, the habitual retention of which caused dilatation of the large intestine and that chronic flatulent distension with which all were so familiar.

ANEURYSM OF THE AORTA COMMUNICATING WITH THE SUPERIOR VENA CAVA.

By Laurence Humphry, M.A., M.D.Camb., F.R.C.P.Lond.,
Physician to Addenbrooke's Hospital, Cambridge.

The patient in the following case was a man aged 49, married, a coachman, who had previously been in the army for 15 years. There was no history of previous illnesses, but he had probably had syphilis. On July 30th, 1908, he drove into the country, and after returning stabled his horse and ate his supper. About 9 p.m. he felt a sudden feeling of suffocation, as if his throat was swollen. He was admitted that night into Addenbrooke's Hospital by the house physician, who noted that he was very short of breath, that there was some swelling of the neck, and that a loud systolic murmur was audible over the chest, but he complained of no pain, but much distress.

Condition on Examination.—When seen the next morning his condition was as follows: The patient was sitting up in bed with evident dyspnœa, the eyeballs were staring; there was extreme cyanosis of the face and ears, and the neck looked thick and swollen; there was some swelling of the right arm and the right side of the chest, and the right hand was cold. The right pupil was larger than the left, the pulses were equal, and the pulse rate 100. On examination of the chest, the apex bea was in the fifth interspace, ¾ in. external to the nipple line, and there was visible pulsation over the second, third, and fourth right intercostal spaces; over this area there was dullness to percussion, and a systolic thrill could be felt. On auscultation there was a systolic murmur at the apex, and over the pulsating area at the aortic base there was a loud continuous murmur of a whizzing character with marked systolic intensification; the murmur could also be heard behind over the spines of the upper dorsal vertebræ; the second sound could be heard feebly. The lungs were emphysematous.

Progress.—After a few days the more urgent symptoms were relieved, but there was still marked cyanosis of the face, and there was some œdema of the right side of the chest and right arm. The superficial veins were becoming visible over the chest, and the external jugular veins, especially the right, were prominent. At first there appeared to be some slight systolic pulsation in this vein, which soon ceased. During the next few weeks the patient's condition gradually improved, so that by September 28th he was able to be up and about, and was discharged from the hospital. The physical signs then showed that the pulsation to the right of the sternum was less marked, and the continuous murmur had much diminished in intensity; the œdema was also passing off, but the superficial veins were becoming more visible.

Readmission.—He was readmitted the following November for an attack of bronchitis following a chill, and it was then noted that the cardiac signs were much the same, except that the thrill and murmur had much diminished in intensity, but that the collateral circulation in the veins had visibly increased. These latter consisted of three large channels on each side of the abdomen, passing up from below from the iliac veins, four on the front of the abdomen, and one situated laterally on each side; the lateral veins passed up to the axilla and veins of the arm, the two in front joined the epigastric and internal mammary veins on the front of the chest wall; there were also some large channels from the thyroid veins. All these large veins were tortuous, and the current of blood was shown, on exercising pressure, to be travelling from above downwards.

Result.—The patient left the hospital again and enjoyed fairly good health for the next twelve months; he could walk about with comfort, but was not capable of exertion or active exercise.

After-Progress.—In November, 1909, he began to be troubled with cough and dyspnœa, and was readmitted to the hospital. There was then increasing cyanosis and œdema of the right arm, neck, and chest, and the lower part of the abdomen was also swollen, but not the legs. The veins were all more distended and loaded, and the intercostal veins were very prominent, but no pulsation could be seen or felt in the external jugulars. The heart was noticed to be markedly displaced downwards; the apex beat was in the sixth intercostal space. He complained of pain round the left side of the chest and under the scapula. He now got rapidly worse, and signs of hydrothorax supervened. He died on January 13th, 1910, having lived close on eighteen months from the time the aneurysm ruptured into the vein.

Autopsy.—The *post-mortem* examination was made by Dr. Aldren Wright. The body was cyanotic and œdematous, except the lower extremities. There was hydrothorax but no pericardial effusion, and the left lung was somewhat adherent to the chest wall in the infrascapular region. At the upper part of the right side of the thorax there was a mass consisting of the aneurysm, distended superior vena cava, right auricle, lung and pleura, intimately adherent together; the heart was greatly displaced downwards and was placed somewhat transversely, so that the upper border of the right auricle was at the level of the fourth interspace. All the external veins were greatly dilated as previously described, and the vena azygos, major and minor, were also much distended. The heart was slightly enlarged, and on separating the mass at the base the condition was as follows: The aorta was dilated and very atheromatous, and from the right and posterior part of the first part of the arch an aneurysm of the size of a Tangerine orange protruded towards the right side, pressing upon and partly enveloping the superior vena cava; above, this vein was greatly dilated, and it has been opened to show the extremely small constricted orifice by which it communicated with the right auricle. The aneurysm has been slit open to show the communication with the superior vena cava, which would admit a No. 8 gum elastic catheter. The aortic valves were competent. There was a second aneurysmal dilatation at the junction of the second and third parts of the aorta. The other organs were healthy.

Observations.

Although, no doubt, this complication in a case of aneurysm of the aorta is a rare one, there are now a fair number of cases recorded, and the symptoms at the time of rupture are very similar to those which have been just described, namely, the sudden onset of a sensation of suffocation, cyanosis, and dyspnœa, with swelling of the neck and right arm; subsequently, at a later stage, if the patient survives, of very characteristic collateral venous circulation. The physical signs of pressure on the superior vena cava, and of the auscultatory signs over the aortic area, consisting of a peculiar continuous murmur with systolic intensification, made the diagnosis of an arterio-venous aneurysm of the aorta almost a certainty. From the state of the veins and the course of the blood stream in this case it was thought that thrombosis of the vena cava had possibly taken place at a later stage, as the blood from the head and upper extremities was evidently being returned in large measure by the dilated superficial abdominal veins and iliac veins through the inferior vena

cava. This, however, proved at the autopsy to be due not to thrombosis but to the gradual narrowing and contraction of the trunk of the superior vena cava just above the right auricle, owing to the pressure of the aneurysmal sac and adhesion of the surrounding tissues. A point of further interest was the slight systolic pulsation noticed at first in the distended right external jugular vein and its subsequent disappearance. The patient was too ill for a polygraph tracing to be taken in the early part of his illness, and unfortunately this was omitted later on. It is probable that the great constriction of the trunk of the vein near the heart may have prevented pulsation being visible in the external jugular. The extreme cyanosis noticed in these cases is due to the obstruction of the circulation.

The prognosis is very unfavourable; in a considerable number of such cases death takes place in a few hours or soon after the rupture. In the case of those who survive the immediate dangers, the length of life depends largely upon a sufficient collateral venous circulation being established. In the case just recorded a year and a half was certainly remarkable; the rupture occurred at the end of July, the venous channels were becoming visible on the surface during the next two months, but it was not till November, or two months later, that the large trunks running between the iliac veins and the veins of the chest and upper extremity were fully developed. For a year after this the patient was able to walk about and enjoyed comparatively good health. During the latter part of this time the intercostal veins became very distended, indicating that the vena azygos was suffering from the backward pressure and the oedema of the chest wall was increasing. Soon afterwards hydrothorax gradually supervened. It would seem that very little of the blood from the head and upper extremities was able to return to the heart via the superior vena cava, and that the bulk of it had to travel downwards and up again by the inferior vena cava.

As has been found in other cases of this kind, the aneurysm had been latent, and had not produced any symptoms to induce the patient to take advice.

DISCUSSION.

Dr. MORLEY FLETCHER commented on the unusual duration of life after rupture was supposed to have taken place. He had seen several cases of thoracic aneurysm with similar signs of pressure on the superior vena cava, with eventual rupture. In these cases, and in most recorded instances, the communication between the aneurysmal sac and the vena cava occurred a few days at most before death.

A CASE OF ACROMEGALY WITH HYPERTROPHIED HEART; PRESSOR SUBSTANCES IN THE URINE.

By LAURENCE HUMPHRY, M.D., and W. E. DIXON, M.D.

THE patient in the following case was a man aged 39, a haberdasher, married, no children, the youngest of four, his mother being 49 at the time of his birth. He sought advice for indigestion and attacks of shortness of breath, from which he had suffered for the last six months. He had noticed also some obesity, with increasing mental and bodily lassitude. His relatives had observed a gradual change in his appearance which had been coming on slowly during the last ten years, consisting chiefly in enlargement of the face, hands, and feet. He himself had not been conscious of this change, but he remembered that he had to have his ring enlarged for his finger, and that his boots had to be made bigger. His habits, as regards alcohol and tobacco were moderate.

He was a tall man, 6 ft. 1 in. in height, about 15 st. in weight, and largely built. The appearance was characteristic of acromegaly, the face was large, especially the lower part, the alae of the nose thickened and coarse, the eyelids rather puffy; the lower jaw was prominent and the chin square; on opening the mouth the tongue was flabby, large, and fissured, the teeth in the lower jaw spaced and on shutting the mouth the lower teeth closed in front of the upper set. The head and ears did not look abnormally large. The hands and feet were squared, and the great toe was large in proportion to the rest of the foot; the wrists and ankles were also thickened. There was no spinal curvature, but there was enlargement of the sternum and costo-sternal articulations from bony outgrowth. The skin was coarse, there was a thick growth of hair on the shoulders and back, and he suffered from molluscum contagiosum. There were no cerebral symptoms, no hemianopia or changes in the optic discs. The pulse was 84, regular; the blood-pressure rather increased, 150 to 160 mm. on two occasions, and the artery wall was thickened. The heart was greatly enlarged, the apex beat in the sixth interspace ½ in. outside the nipple, the impulse heaving; the precordial dullness extended from the third to the sixth rib. There was a short systolic murmur at the apex, and an accentuated second sound at the aortic base. There was some dullness over the upper part of the sternum which it was thought might be due to an enlarged thymus, but this proved not to be the case. The thyroid and genital glands appeared normal. There was no dropsy. There was slight nocturnal diuresis; the urine was 1018, acid, no albumen or sugar, and the total quantity was about three pints in the twenty-four hours. The attacks of shortness of breath frequently occurred during the night, were cardiac in character, accompanied by quickend pulse-rate, some cyanosis, and precordial distress, and lasted for a few minutes. The lungs were normal, except for slight emphysema. The abdomen was normal, the liver dullness rather increased and the spleen was not felt. The general muscular system was not unduly developed. The reflexes were normal. The skiagrams of the hands and feet showed general enlargement of a uniform nature, without changes in the density of the bones. The shafts of the metatarsals, except that of the great toe, showed some diminution in diameter, whilst the shafts of the metacarpals were if anything thickened. Small osteophytic outgrowths at the bases of some of the bones of the phalanges were evident, but not more than may occur in some normal hands and feet. The skull was not taken.

The patient was shown at a meeting of the Cambridge Medical Society in May, 1910, as a case of acromegaly, and subsequently, at Dr. Dixon's suggestion, it was decided to ascertain if there were any pressor substances in the urine.

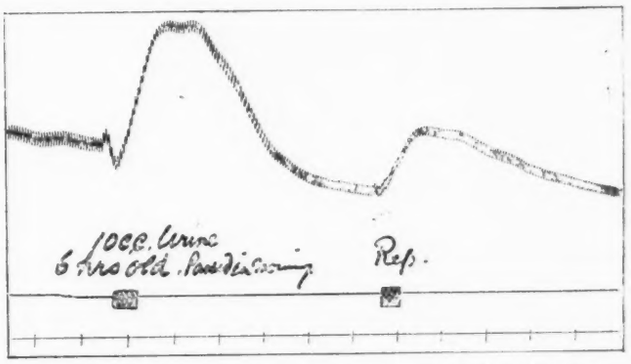

Fig. 1.—Cat pithed. Blood pressure shows the effect of injecting 10 c.cm. urine on two occasions. Time, 30 sec.

It has been shown that the urine of the cat contains pressor substances after the injection of pituitary extract,[1] and it has been assumed that this is evidence that the active principle of the pituitary gland (posterior part) is excreted in the urine. We therefore examined the urine of the patient for substances inducing a pituitary-like action. For this purpose the cat was employed; its brain was completely destroyed by pithing, artificial respiration was performed by a pump, and the blood pressure recorded from the carotid artery. If 10 c.cm. of the urine of the patient were injected into the jugular vein the blood pressure rapidly rose some 70 to 80 mm. of mercury, and the pressure remained high some two minutes before it fell to normal (Fig. 1). This effect was associated with very definite acceleration of the heart and constriction of the peripheral arterioles. Before the rise in blood pressure started there was seen usually a small fall of blood pressure; this corresponds exactly with the fall of blood pressure which results when normal urine is injected into the circulation and is caused by the presence of potash salts. Second and third injections caused a diminished rate of blood pressure, a phenomenon which is characteristic of pituitary extracts. It made no difference to the pressor action whether the urine was injected immediately after being passed or whether it was six or eight hours old. Even after the urine had been kept for four weeks, putrefaction being prevented by a crystal of thymol, the pressor substance was easily detected. All samples of the urine, whether passed first

thing in the morning or at other times, contained the pressor body, which was quite unaffected by boiling the urine. The question of the nature of the pressor substances is very difficult to decide; it may be, of course, that it is pituitary extract, or it may be that it is one or more of the bodies which occur in traces in normal urine and which it has been suggested might arise from putrefaction in the bowel. These pressor bases have been extracted from normal urine by Abelous, who refers to them as "urohypertensine," and the action of one such body obtained from putrefying meat or from ergot (p. hydroxyphenyl ethylamine) has been described in detail.[2] The amount, however, of pressor substance in normal urine is quite different from the amount in the urine under discussion. Normal urine injected into the vein of an animal causes an immediate fall of blood pressure, of a degree depending to a large extent on the amount of potash salts lately taken, followed by a gradual rise to normal (Fig. 2). To observe a distinct pressor effect, large amounts of urine—a litre or more—must be extracted with suitable solvents, which, while dissolving the pressor substances, will leave the depressor substances.[3] The urine in this case, in spite of the depressor substances present, caused a marked rise in systemic blood pressure.

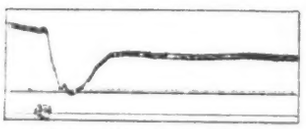

Fig. 2.—Cat pithed. Blood pressure shows the effect of injecting 5 c.cm. normal urine. This urine contained more potash salts than usual, probably on account of eating vegetables.

The evidence on the whole points to the conclusion that the pressor substance is not pituitary in nature, for the following reasons: The effect of subsequent injections, although causing a diminished effect, still induces a considerable increase of blood pressure, greater than would be obtained were the pressor substance pituitary in nature. The pressor substance inhibits intestinal movements, whilst pituitary extract is said to increase peristalsis.

We have only had the opportunity so far of examining one other case of reported acromegaly in a young girl. This was an early case, but the urine showed distinct evidence of the presence of abnormal amounts of pressor bodies, though less than in that of the patient described. In this case 20 c cm. of urine were required to be injected to produce a marked effect. After such an injection the blood pressure slowly rose 43 mm. of mercury; the blood vessels showed evidence of constriction, and the rate of the heart was considerably increased. All the evidence we could obtain pointed to an effect similar to that obtained from the urine of the first patient. We only mention this case as affording evidence that the presence of large amounts of pressor substances in the urine is not an accidental association of acromegaly.

The patient went to the seaside for a change at the end of May and came back feeling much better. He went to work, but died suddenly on the night of June 15th.

The *post-mortem* examination was made on June 17th, forty hours after death. The skull showed marked thickening of the calvarium, but the brain and meninges appeared normal, and there was no increase in the amount of cerebro-spinal fluid. On lifting the brain from the base of the skull the pituitary gland was seen to be much enlarged and protruding, and of a purplish colour, and the sella turcica was thinned and somewhat worn away. The heart was greatly enlarged, the weight being 2 lb. 13 oz.; the valvular orifices and cavities appeared normal. The wall of the left ventricle was greatly hypertrophied, the thickness on section measuring 1⅜ in. There was slight early atheroma at the root of the aorta, but the rest of the arch appeared healthy. The pericardium contained a considerable quantity (about 45 oz.) of fluid. The liver was slightly enlarged; the spleen was very large, and weighed 1 lb. 7 oz. The kidneys were also enlarged, weighing 9 oz. each; the capsule was rather adherent, the cortex was not diminished. The adrenals were not examined. The thyroid was normal, and there were only a few remnants of the thymus body. The radial vessel was somewhat thickened but the cerebral vessels were normal; the other organs were normal. There was nothing obvious to account for the sudden death. The pituitary gland was greatly hypertrophied; it weighed 8.6 grams, the average normal weight being ½ gram, and measured 4½ cm. in length by 2½ in width; the capsule was thickened. On section it was soft and diffluent, and there were signs of an old haemorrhage. The anterior lobe was especially enlarged.

It was decided to ascertain if there were any pressor substances in the tissues. Saline extracts were made of several tissues soon after removal from the body—spleen liver, and pituitary gland—as 2 per cent. solutions. These were injected into the circulation of a cat with a view to determining the amount of pressor substance present. The pituitary gland was separated into anterior and posterior lobe, and injections were made of extracts from both these. The injections of the pituitary gland caused an immediate fall of blood pressure, with some cardiac slowing and rapid recovery; with neither lobe was there any evidence of a pressor action (Fig. 3). Extracts of other organs, liver and spleen, caused a typical effect, namely, a fall of blood pressure, but this was followed by some rise quite in excess of that which may occur normally, and suggesting the presence of pressor substances in the extracts (Fig. 4). Now as the *post mortem* examination was performed about forty hours after death, it is hardly likely that the active principle of the pituitary gland would be destroyed in that time, yet not a trace of pressor substance could be found. The presence of pressor substances could, however, be determined readily enough in other tissues. This appears to afford further evidence that the pressor substances described in the urine are not secretions from the pituitary body, but are substances either absorbed from the alimentary canal or produced in the tissues, for the reason that the tissues contain an excess of such bodies, whereas the pituitary gland was deficient in pressor substance.

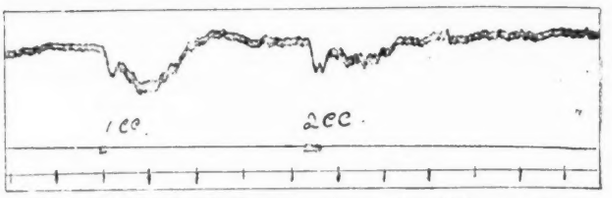

Fig. 3.—Cat pithed. Blood pressure shows effect of injecting a 2 per cent. solution of pituitary extract (posterior part). Time, 30 sec.

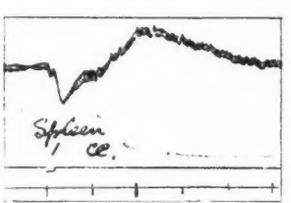

Fig. 4.—Cat pithed. Blood pressure. Shows the effect of injecting 1 c.cm. 2 per cent. spleen extract into jugular vein. Time, 30 secs.

Histological examination of the pituitary gland showed the enlargement to be mainly of the anterior part of the gland, which was compressing the posterior and intermediate parts; the general appearances were those of hyperplasia of the gland tissue of an adenomatous type, the chromophile cells being greatly increased in number in common with the other cells. In the pars intermedia were follicles containing colloid substance, not numerous, and widely distributed some distance apart; the posterior part was also enlarged, and the connective tissue increased in amount.

The kidneys showed some fibrosis, but the gland cells and secreting tissue were healthy; the spleen showed simple hyperplasia. The radial artery was thickened, especially the muscular coat. The heart muscle showed pure hypertrophy.

Conclusions.

We believe that the observations made in this case may throw some new light on the phenomena associated with acromegaly. The patient had undoubtedly been suffering from this disease for the last ten or more years, but, not being a hospital patient, opportunity for observing him had been on only two or three occasions during the few weeks before his death. Interest had rather centred round his greatly hypertrophied heart, his blood pressure, and the pressor bodies in the urine. The only two observations of his blood pressure we were able to make are not sufficient, and, although the measurements of 150–160 mm. of mercury are rather high for a man under 40, it does not appear adequate to account for the excessive hypertrophy of the left ventricle; at the same time we are not able to say what his blood pressure may have been registering during the previous ten years. The attacks of dyspnoea were suggestive of cardiac asthma, not uncommon in these patients, and probably due to waves of high blood pressure associated with considerable limitation of the field of cardiac response. With

regard to the pituitary gland, the pars anterior was greatly hypertrophied, and with this we connect the growth of the skeletal tissues, including bone cartilage and connective tissue; the constant association of these two phenomena, especially in adults and when active growth has ceased, is strong presumptive evidence that they are in some way related together. The pars intermedia and posterior are much less affected, and forty hours after death gave no evidence of containing the specific pressor substance of the gland.

The second phenomenon of importance was the constant presence of very large amounts of pressor substances in the urine and the fact that *post-mortem* evidence of pressor substances was also obtained in the tissues. The evidence is against this substance or substances being related in any way with the posterior portion of the pituitary body for several reasons: (1) The vascular effects are much more characteristic of other substances, such as p. hydroxyphenyl ethylamine, than of pituitary extract. (2) If the pressor substances were pituitary in nature, the flow of urine should have been more decidedly increased; and (3) perhaps most important of all, the gland contained no active principle at a time when the other tissues contained a pressor body.

It is almost impossible to regard the presence of pressor substances as accidental, because of the second case which shows the same condition.

The third condition which is important in this case is the hypertrophy of the heart and blood vessels in the absence of valvular disease and atheroma. It is important to remember that this is a common feature of acromegaly, although in descriptions of the disease the more pronounced bone changes have overshadowed all other conditions. The liver, spleen, and adrenal bodies are also frequently enlarged.

We have thus four main points to correlate:

(1) The presence of pressor substances in the urine and tissues in great excess.
(2) General hypertrophy of organs, liver, spleen, and especially the cardio-vascular system.
(3) Hypertrophy of the pituitary body out of proportion to the hypertrophy of other organs.
(4) Bone changes.

(1) and (2) are obviously closely associated together. Indeed, we may say that given (1), then (2) follows as a natural sequence. Harvey, working in the pharmacological laboratory at Cambridge, has shown that pituitary extract, ergotamine, and other pressor substances administered to rabbits, caused marked hypertrophy of the heart and a smaller effect on other tissues. With regard to (3) and (4), however, we have no positive knowledge. It may be that the hypertrophy of the pituitary is primary in acromegaly and the bone changes secondary to it, or it may be that its hypertrophy is secondary, as is probably the case with the heart, liver, and spleen.

If the latter were found to be true it is conceivable that the whole series of phenomena are the result of vascular changes induced by pressor substances. But whatever explanation we are going to adopt it must be remembered that in no other condition that we are aware of have large amounts of pressor substances been found in the tissues and urine, amounts probably one hundred times greater than those which are normally present. No attempt has been made to give any references to scientific papers on the action of pituitary extracts, for these we would refer to Schäfer's Croonian Lecture, *Proceedings of Royal Society*, 1909, lxxxi, 442

We are indebted to Dr. W. H. Harvey for his assistance in the *post-mortem* examination and in the histological examination of the tissues.

REFERENCES.

[1] Dale, *Bio-Chemical Journal*, iv, 427, 1909. [2] Dale and Dixon, *Jour. Physiol*, xxxix, 25, 1909. [3] Bain, *Lancet*, August 7th, 1909, and April 30th, 1910.

DISCUSSION.

Professor BÄUMLER (Freiburg) thought that the two most important features of this case were the great hypertrophy of the heart and the presence of a substance in the urine causing great increase of blood pressure. As regards the hypertrophy of the heart, one could imagine it might be a direct effect of the change in the pituitary body brought about like the hypertrophy of other organs. As to the absence of any pressor substance in the diseased gland, which Drs. Humphry and Dixon had demonstrated, one had to think of some as yet unknown influence of the disease on organs in which, as they had shown, pressor substances were formed.

EVOLUTION OF RACIAL TYPES OF EUROPE: ITS BEARING ON THE RACIAL FACTOR IN DISEASE.

By J. S. MACKINTOSH, M.R.C.S., L.R.C.P.,
London.

IT has been estimated that the great ice age, when Europe was covered with glaciers, came to an end about 40,000 years ago. This was brought about by a gradual change of climatic conditions from a uniform humid cold to an era characterized by great dryness and extreme ranges of temperature, with hot summers and frosty winters, not unlike those of Canada or Manchuria at the present day. I would call particular attention to the low degree of humidity; it was this that caused the recession of the ice. With the ice disappeared the ape-like Neanderthal type of man. He was replaced by a higher type—the common ancestor of our long-headed races of Southern, Western, and Northern Europe—this type being supposed by some anthropologists to have found its way into Europe from North-Western Africa, possibly driven thence by the drying-up of the Sahara or the modifications of the Mediterranean Sea. Others think he was directly evolved from the Neanderthal type. The old idea, founded on philological grounds, of a great Aryan invasion from Central Asia, is, of course, nowadays practically abandoned

At the present day European dolichocephalics approximate to one of two chief types—the Iberian (small, slender, leptorrhine, and brunette), and the Teutonic or Nordic (tall, muscular, leptorrhine, and blonde). I believe the Iberian—the "Italian organ-grinder" type, which is found as far north as the Hebrides—to be the evolutionary product of the milder Atlanto-Mediterranean influences, the Teuton of the more rigorous climatic conditions, whose gradual retreat he followed to the North-East, as, through the centuries, Western Europe grew milder and damper. The purer types of this Teutonic race are, therefore, now mainly found in the Baltic regions, though there is clear evidence that in prehistoric days they were spread right across the great northern plain of Europe. This is shown by the distribution of their characteristic "*reihengräber*," or "graves in rows," from France to the Urals.

But, apart from climatic influences, another factor contributed towards the separation of Iberian from Teuton. This was the appearance of the Alpine race—short, thick-set, snub-nosed, brachycephalic, and brunette. The "Alpines" came from the East, along the mountainous regions of Central Europe, and drove a wedge between Iberian and Teuton, penetrating in force as far west as Brittany, and undoubtedly settling to some extent in the British Isles. It is supposed by some that they came from the mountainous regions of South-West Asia, brachcephaly being an Asiatic racial character. Their invasion was peaceable, and they intermarried on their frontiers with the dolichocephalics, skulls intermediate in type being found in ancient burials. Here, then, we have three radical racial types, whose respective evolution took place under radically different climatic conditions. Their social conditions also differed. The Alpines were given to dwelling in communities from the earliest times in which their traces are found—first as cave or pit-dwellers, later in the well known lake dwellings. The Iberians were also troglodytes and pit-dwellers, those on the Atlantic coast requiring in particular shelter from the weather. With the Teutonic types the case was far different. De Mortillet, writing of their presumptive ancestors of the Magdalenien period in his well-known work, *Le Paléolithique*, lays special stress on the fact that they were not troglodytes, but wandering hunters and dwellers in the open. In historical times Tacitus, and later on, Strabo, bear witness to the "Germans'" nomadic habits and their aversion from communal life.

In this country the Iberian was the aboriginal of the post-glacial era. Following him came the Alpine and a tall, sub-brachycephalic type, probably a cross between Teuton and Alpine, or some other brachycephalic race. Lastly came the great historical invasions—mainly Teuton. The Teuton, broadly speaking, came last, and he came from a drier climate, therefore he should be more

susceptible to climatic influences than the other types. Recorded observations have borne this out.

Dr. Shrubsall has concluded, from a wide and careful survey of statistics, which he presented in a paper entitled Physical Characteristics and Morbid Proclivities, in the *St. Bartholomew's Hospital Reports*, 1903, that blonde types in this country are specially liable to tonsillitis, rheumatism, heart disease, and osteo-arthritis. From my own observations I would add catarrhs. It is notable also that the damper districts of Eastern England are populated mainly by a small dark type as seen in the fens, the great clay districts of the Sussex Weald, in the boulder-clay region to the north of London, Romney Marsh, etc. The same phenomenon occurs in Holland, the brunette types being concentrated on the marshy levels west of the Zuider Zee. This is well shown in a diagrammatic map in Professor Ripley's *Races of Europe*. Blonde types, again, as is well known, fare ill in towns, tending to die out. Is this surprising in view of their 40,000 years of open-air wandering, and their historic aversion from communal life? Their tendency to claustrophobia is explicable on the same grounds, agorophobia being rather a complaint of brunettes, and much rarer than claustrophobia. The blondes came as conquerors; the older brunette types form in the main the lower classes. The special complaints of brunettes, according to Shrubsall, are phthisis, nervous diseases, and malignant growths. The first two, at any rate, are mainly social diseases, the dusty trades claiming many victims; but nevertheless the Ibero-Alpine types thrive, or at any rate survive, in the life of the city for which their evolution has to some extent prepared them. In hybrid races the dominant or preponderating type of the individual will determine his pathological bias in certain directions: the children of hybrid parents often revert of course towards one or other pure ancestral types. On the other hand, where a community originally of mixed race has been long settled and long undisturbed, recognizable local subtypes tend to be evolved by a process of selection, presenting a combination of traits best suited to local climatic and social conditions.

Can any practical use be made of the study of disease in its racial aspect? Most certainly! What is the "open-air" treatment of phthisis but an empirical attempt to restore the patient to his natural racial environment? Cannot its successes and failures be explained on racial lines, such as, for instance, the progress of certain consumptives made in the cold, dry winter and lost in the damp summer of the Alps? What is the meaning of the present popularity of the high Alps in winter as a holiday resort, or the old saw that a green winter makes a fat churchyard, if not that a dry, frosty winter is a physiological necessity to at least a section of our population, and was probably more so formerly?

Dr. Trudeau, after injecting rabbits with tubercle, found that in those kept in a damp cellar the disease progressed, while those restored to the warren rapidly recovered.

The cow, like the Teuton, is essentially a nomad. Yet our dairy farmers persist in trying to breed a race of troglodyte cows, immuring them in dark, stuffy sheds, with results familiar to us all.

I suggest that in studying the racial characteristics of our patients we can act on a cardinal principle in the choice of locality for school, home, holiday, health resort, or migration. We can anticipate the course certain diseases are likely to follow, we can understand the restlessness of our blondes when we keep them long in bed, and the futility of their attempting a "rest cure" in a London nursing home. We can discern why certain cases of tuberculous joint disease do well on the coast while others do not, but improve in a London hospital, or, as Sir William Bennett has noted (*Practitioner*, June, 1910) on returning to their place of nativity. We can comprehend why Jews and other races from warmer latitudes have a pathology of their own when resident in this country, and why we have one when we go to live in theirs. I believe the success of certain special diets has a relation to the racial type. Perhaps we have here a clue to certain cravings for stimulants, alcohol counteracting the sense of chill to the skin in types susceptible to damp. In short, we can hold in our hands a master key to the secret of many pathological mysteries, and the racial factor in disease is, if the points I raise hold good, of an importance hardly to be overestimated.

STARVATION AND PURGATION IN THE RELIEF OF DISEASE.

By Dr. G. GUELPA,

Paris.

IN modern science (teaching, literature and medical practice) certain facts and corresponding deductions are received as undoubted truths, which, when examined with a little care, prove to be absolutely false and pernicious for the preservation of health and for the cure of disease.

I am going briefly to sum up some facts which have served as a basis for the method which I present.

1. Emaciation is almost always looked upon as unfavourable, even dangerous. On the contrary, it is generally useful, and often it should certainly be encouraged because it enables the body to rapidly remove the intoxications which are the cause of the disease.

2. Weakness is not a manifestation of deficient nutrition as one understands it to-day, but is the result of imperfect removal of toxins.

3. Hunger is not the expression of need of the body for repair of its waste, but it shows us the degree of active intoxication in the digestive system. The incontestable proof of this is that cleansing of the digestive tract, especially repeated cleansing, causes the disappearance of hunger instead of an increase.

4. As a corollary, one must cease to limit the rôle of food to simple compensation of the waste of the body, for first of all it serves the purpose of absorbing and neutralizing the toxic products which are produced in the alimentary canal. It is only then that it performs its second rôle, which is to repair the waste of the body.

5. There is absolutely no danger in remaining deprived of food for several weeks provided care be taken to relieve the digestive tract of waste products and poisons which are daily formed there. When death occurs after only several days or weeks of starvation, it is not brought about, as some think, by the fact that the waste of the body has not been replaced, but it is the result of the excess of toxins which have accumulated and have not been excreted.

6. Purgation, when it is thorough and not drastic, is never a cause of dangerous inflammation of the digestive tract, even if repeated during several days in succession. It has, on the contrary, the advantage of securing disinfection of the digestive tract when that function is performed imperfectly, or not at all, by the food.

7. Purgation and deprivation of food, when their duration is not too prolonged, do not cause anaemia, but, on the other hand, they are the best means of increasing the red corpuscles, the haemoglobin, and the leucocytes in their most vital form—the mononuclears.

These principal statements, together with a number of others of less importance, all of which have been long and carefully controlled, have led me to the conception of the method which I present,[1] the chief idea of which is to ensure the most regular and rapid elimination possible of the waste products and poisons of the body by means of privation of food and purgation at repeated intervals during three, four, or even more days.

This method of treatment is never harmful; it is nearly always useful, and it sometimes gives truly marvellous results. Thus it brings about the cure of diabetes, even when accompanied by the most serious complications. It speedily arrests its development, and causes complete disappearance of all its manifestations in several days or weeks.

Owing to the limited time at my disposal I cannot give you clinical observations to illustrate all these interesting points. I will confine myself more specially to the subject of diabetes, and quote you a single case, which demonstrates how active and quick is the action of judicious purgation with deprivation of food in the treatment of this disease.

Three months ago an American gentleman, passing through Paris, slightly injured the end of his little toe in getting into a carriage. Acute inflammation soon developed, and rapidly involved the whole foot. The patient had been suffering from diabetes for many years, and had 300 grams of sugar and more than 4 grams of albumen. Drs. Suzor, Vignat, and Levassort (surgeon), being unable to arrest the gangrene, arranged for amputation. But before this radical measure was undertaken they called me for consultation.

We decided the treatment of "*Désintoxication*," and I predicted confidently the speedy arrest of the progress of the disease and its early cure. In fact, next day the livid appearance of the foot had given place to a more healthy tint, and a fortnight later the patient was no longer passing sugar in the urine, and only 50 cg. of albumen, this being due to the fact that he would not consent to a total deprivation of meat. It was only necessary to remove the terminal phalanx of the little toe, which was already necrosed when I began my treatment. At the end of a month the patient went out, in possession of his foot and having no sugar in the urine, to take a holiday on the Mediterranean coast. A few days ago he wrote to me that his recovery remained complete. The same result is so easily and always realized when the *désintoxication* is seriously applied.

This treatment exercises the same influence against all diseases by reducing nutrition. It brings about the disappearance of tophi and ankylosis of long standing when applied in cases of gout with the necessary rigour and persistence.

I cannot refrain, in connexion with this, from quoting briefly the case of a patient who came to me from the Hospital Tenon, where he had been for more than a year, and whom I kept in my house in order to bring about the result which I foresaw, but which at first seemed impossible. He was a man, aged 48, a house painter, who since the age of 18 had been afflicted with pains, and for the last twenty years had been unable to work for more than five or six months during the year, owing to exceedingly painful attacks of gout. For the last five years he had been unable to work at all, and he had spent the last two years in bed, either at home or in the hospital. The joints were so fixed that he could not even dress himself, and the condition of his hands and arms prevented him from feeding himself. The erect position was very irksome on account of the semiflexed condition of his knees. Nearly all the joints were more or less fixed and deformed, as though embedded in deposits of urates. Owing to the condition of his vertebral column he had lost generative sense and he could not write or read, on account of sensations of burning, of flickering, and of lacrymation of the eyes, which came on after a few minutes of trying to read. His power of comprehension was also very slow, and his memory was much impaired. He was subjected to various periods of my treatment, which lasted during a week. In five months he underwent *ninety* days of absolute fasting and about *seventy* purgings. His weight diminished from 87 to 60 kilos. Simultaneously with this, an immense improvement in his general condition took place. As a matter of fact the gouty patient could now read and write without the least difficulty for several hours at a time, he could dress himself without anybody's assistance, and he could walk and occupy himself with all kinds of work. Almost all the joints have become supple and mobile; the uratic deposits have almost entirely disappeared. The tissues, which previously were oedematous and fixed like those in a case of long-standing paralysis, have now returned to normal. He is absolutely changed. He recovered his generative sense, and is now in a position to earn his living.

This treatment is also very useful in a number of other diseases, and it should be used with great advantage in surgery, especially as a preparation for operation and as a powerful factor in inflammatory resolution.

Finally, this method is of great utility in the preservation of health. It specially rejuvenates the body by rendering all the functions more facile—respiration, digestion, sight, hearing, and above all, thought and activity.

There is certainly no more rapid and more efficient means of combating distraction, somnolence, and cerebral lassitude. It will, without doubt, have a great place in the hygiene and therapeutics of the future, and it will certainly contribute to the prolongation of *healthy* longevity.

REFERENCE.

[1] Guelpa, *Auto-intoxication et désintoxication*, Paris, 1910. O. Doin, editeur.

DISCUSSION.

The PRESIDENT (Dr. R. W. Philip) congratulated Dr. Guelpa on the results he had recorded. Since the report of Dr. Guelpa's observations in the *Bulletin de thérapeutique* last year the speaker had adopted the principle proposed in certain cases of diabetes. The results had been corroborative of some of the speaker's contentions.

THE INJECTION TREATMENT OF NEURALGIA AND SCIATICA.

By WILFRED HARRIS, M.D., F.R.C.P.,
Physician to St. Mary's Hospital, and to the Hospital for Epilepsy and Paralysis, Maida Vale.

BOTH experimental and clinical work have shown that the injection of strong alcohol into a nerve trunk causes immediate paralysis, both motor and sensory, of its distribution, by destroying the nerve fibres at the point of injection. This method of local destruction of a sensory nerve by alcohol injection is therefore eminently suitable for the arrest of a chronic and obstinate pain due to sensory impulses generated at the periphery of a nerve, such as tic douloureux, fibrositis, rheumatic neuralgia, supraorbital neuralgia, etc. When the pain is of more central origin, as in post-herpetic neuralgia, unless the alcohol can be injected into the posterior root ganglion, which is a difficult though possible operation, the neuralgia will not be benefited. When the pains are due to posterior root lesions or to sclerosis of the posterior spinal columns, injection of alcohol into the distal portion of the nerves will be of no avail.

During the last two years I have used Schlösser's method of deep alcohol injection of the main branches of the trigeminal nerve in 62 cases of recurrent pain affecting the fifth nerve in one or more of its branches, and on June 11th last I published in the BRITISH MEDICAL JOURNAL my results with this method in trigeminal neuralgia only. Of these 62 cases 41 were cases of tic douloureux or trigeminal neuralgia; 38 of these were completely relieved of all pain for periods varying from two months to fourteen months and upwards. The shorter periods of relief of pain were obtained in those cases in which the injection was perineuritic, not into the substance of the nerve, as proved by the absence of any detectable anaesthesia. Such perineuritic injection of the deep trunks in trigeminal neuralgia is very variable in its effects. Sometimes it produces no effect at all on the pain, and in others the relief is immediate and complete but its duration is quite uncertain, though I have seen it last two months, four and a half months, seven months, and twelve months. On the other hand, if the nerve is properly hit by the injection, as proved by the presence of deep anaesthesia of the skin and mucous membrane supplied by the nerve injected, then we shall be quite safe in promising a minimum of six months' cessation of all pain, and in all probability much longer, even as long as three years having been recorded by Kiliani. In a few cases the pain will recur after a successful injection in another of the three main branches of the fifth; thus, when the pain appeared to be at first localized to the lower jaw, and perhaps the tongue, after successful injection of the foramen ovale, the pain may recur at any time in the second division, affecting the upper jaw and nose, necessitating injection to the foramen rotundum. This does not often happen but may do so; or, after arresting the pain in the upper jaw and nose by injection of the foramen rotundum, it may be found necessary to inject the supraorbital nerve on account of pain recurring in the forehead. Two main trunks should never be injected at the same sitting, because, although pain may be complained of in both upper and lower jaws, yet the pain is generally due to either the second division or the third division being involved by the neuralgia, the pain in the other jaw being a reflected pain, which may disappear entirely after injection of the chief offender.

In two of my cases the tic douloureux was bilateral, in each case affecting the third division on each side alternately. In one of these cases the Gasserian ganglion had been removed ten years ago, leaving the ophthalmic portion. After nine years' relief the pain recurred in the opposite lower jaw, and then returned in the original position in the left lower jaw with furious intensity, although this area was quite anaesthetic. This is the only case in which I have seen the pain of true tic douloureux return in a deeply anaesthetic area, yet injection of 90 per cent. alcohol into the foramen ovale under chloroform completely arrested the pain on that side. The pain after three days reappeared on the opposite side in the third division, and I then injected the right foramen ovale, producing

anaesthesia of the lower gum, lip, and tongue, with complete cessation of pain, which has now been absent for six weeks.

Similarly, in my other bilateral case, a lady of 57, the pain has persisted for nineteen years—first in the right and then in the left lower jaw and tongue. Under choloroform I have injected the foramen ovale on both sides, so that at present she is quite free from pain, and anaesthetic on the whole of the front of the tongue, the whole of the lower jaw, chin, and lower lip. This makes eating and drinking a somewhat slower process, and she is apt to dribble, though she enjoys her food now thoroughly. The youngest age for the start of the neuralgia that I have met with is 17, in a lady now aged 37, who had suffered from third division neuralgia for the past twenty years. She is still free from pain, fourteen months since I injected the right foramen ovale. My oldest patient commenced to suffer at the age of 81, and had been suffering from characteristic spasms of intense pain in the right lower jaw for six months, when injection of the right foramen ovale under chloroform completely relieved her, nine months ago. Injection of the foramen ovale I prefer on the whole to do under chloroform, and I can now make practically certain of always finding and recognizing the foramen ovale with my needle. Injection of the first and second divisions at the supraorbital notch and foramen rotundum should always, if possible, be done without a general anaesthetic. These two operations are distinctly less painful than injection of the foramen ovale, or rather, the finding of the nerve at the foramen ovale is often much more painful, though the stinging pain of the injections is much the same in each case.

Beyond the sensations of numbness of the skin treated, no disabilities follow the use of injections. I have never seen any trophic effect after injection whatever, except in two cases slight temporary falling out of hair above the forehead in injection of the supraorbital notch.

Considerable itching, and inability to relieve the itching by scratching I have seen follow on the anaesthetic area of the forehead and scalp in four cases of injection of the supraorbital nerve; this may last some weeks.

In addition, I have used deep injection of strong alcohol into the tissues for the relief of the pain in over 150 other cases of persistent neuralgia, in rheumatic costal neuralgia, so-called intercostal rheumatism, and interscapular, lumbar, and sacral fibrositis. The relief in a large number of these cases is almost instantaneous, becoming apparent as soon as the pain of the injection has passed off—in half a minute or less. In four cases severe neuralgia spreading from the shoulder down the arm, associated with areas of intense tenderness to pressure over the back of the shoulder and arm, which had persisted in one case for seven years, in another two years, and in a third for twelve months, were completely cured by deep injection of strong alcohol. In treating the shoulder and arm, however, care must be taken not to inject either of the main nerve trunks to the limb, or inevitably muscular paralysis of the limb will follow.

Fibrositis of the buttock may simulate a sciatica, or may precede and then accompany a rheumatic sciatic perineuritis. Deep injection of strong alcohol in many such cases is of almost instant benefit, the relief from pain and limping gait being complete and generally lasting, though sometimes requiring repetition. Great care must be taken not to inject alcohol, or sulphuric ether, or carbolic acid solution into the sciatic nerve, or paralysis of the leg will inevitably follow. I have seen these treatments recommended, but if their injection is not followed by paralysis this is undoubtedly due to the needle having missed the nerve.

In 34 cases of chronic sciatica I have used a modification of Lange's infiltration of the nerve with warm normal saline solution and eucaine. Sometimes two or even three saline injections will be required, at intervals of a week, especially if the sciatica has persisted for six months or more. Twenty four cases were completely cured, 7 considerably improved, and 3 received no definite benefit. Lange's method was to find the nerve with a long needle in the neighbourhood of the notch, and then inject into it 100 c.cm. of 1 in 1,000 eucaine β in normal saline. This is, however, a very painful process, and I find it far preferable, after finding the nerve, to anaesthetize the nerve by injecting it with 2 c.cm. of 1·5 per cent. eucaine, and then after waiting some fifteen seconds to continue the injection of 100 c.cm. of normal saline into the nerve, which is then quite painless. I use a needle 9 cm. long and 0.7 mm. in diameter, and insert it at the lower gluteal fold immediately over the anatomical position of the nerve; the needle is pushed in obliquely upwards so as to strike the nerve at an angle of about 60 degrees just below the point where it passes over the ischium. The patient will instantly complain of a sudden painful tingling in the foot, in the heel if the internal popliteal portion has been struck, and in the ankle and top of foot if the external popliteal half has been pierced. Care must be taken to hold the needle quite still, and then a syringe filled with normal saline is fitted on and 2 or 3 c cm. slowly injected. If this causes definite pain in the foot then the point of the needle is still within the nerve, and the syringe is then changed for a smaller one ready filled with 1·5 per cent. eucaine β solution, and 2 c cm. slowly injected into the nerve. After fifteen seconds the nerve is sufficiently numbed to bear without pain the further injection of 100 c cm. normal saline, care being taken all the time to hold the needle steadily without shifting its position.

The immediate result is a sensation of slight numbness and heavy feeling of the whole leg, with a slight ache at the point of injection. The patient should not get up for at least twelve hours after the injection. Next day it will generally be found that the pain is very much less; that the leg can readily be raised to an angle of 30 degrees or more without pain; and in some cases, especially those which have not lasted more than six weeks to two months, the cure may be complete. In only two cases have I seen a rise of temperature to 100° or more within two or three hours of the injection, in one case with a definite rigor. This is described by Bum and other German writers as of frequent if not regular occurrence. In any case the temperature falls again within two or three hours.

I have never used this method for an acute sciatica of less duration than five weeks, as I consider that rest, especially on a water bed, cataphoresis, local heat, and other medicinal measures should first be tried. If these fail after three or four weeks, then injection of the nerve with eucaine and saline as above described is, I believe, the best remedy.

DISCUSSION.

Dr. O'SULLIVAN (London) said that Dr. Wilfred Harris had been eminently successful in his treatment of trigeminal neuralgia by alcoholic injection. The method mentioned in the removal of the Gasserian ganglion necessitated the use of chloroform—the patient being necessarily perfectly quiescent. Dr. Harris had operated on many occasions without the aid of chloroform and with very good results. The operation for the relief of trigeminal neuralgia was effected by the passing of a minute trocar through the foramen ovale and the foramen rotundum. The speaker's information had been principally derived from Dr. Wilfred Harris's able paper in the BRITISH MEDICAL JOURNAL of June 11th, 1910, and from his work "Alcoholic Injection Treatment for Neuralgia and Spasm," *Lancet*, May 8th, 1909.

THE EFFECTS OF ELECTRICAL CURRENTS UPON BLOOD PRESSURE.

By ETTIE SAYER, M.B Lond.

ARTERIAL blood pressure is the product of cardiac systolic force and peripheral resistance. It is regulated by the vasomotor mechanism.

It is lowered in:

(1) Cardiac weakness.
(2) Loss of body fluids—haemorrhage, cholera, etc.
(3) Exhaustion of the vasomotor centre—surgical shock.
(4) Fatigue of the vasomotor centre—some neurasthenias.
(5) In fevers from excessive metabolism.

It is raised by:

(1) Cardiac stimulation.
(2) Increased peripheral resistance.
  (*a*) *Temporarily*—Cerebral compression; violent emotions; any strong sensory stimulus, as pain, etc.
  (*b*) *Chronically*—Hypertonus, which if left to itself goes on to arterio-sclerosis, finally ending in apoplexy, Bright's disease, or heart failure.

It is the object of this paper to deal with certain cases of hypertonus in which the vasomotor spasm was relieved by high-frequency currents.

Auto-Intoxication in Neurotic Subjects.

CASE I.—The patient was about 55 years old. Climacteric at 40; attacks of giddiness since. Frequent headaches; very run down. Micturition every two hours. "Never does, never has, and never intends to take any exercise." Drives everywhere; smokes a great deal; likes "wine and all good things." Slight albuminuria. Heart *nil*.

Before treatment the systolic blood pressure was 238 mm. after treatment it was 156 mm.

After-History.—After 36 treatments the blood pressure fell to 156 mm. Subsequently the patient had an attack of bronchitis, after which the blood pressure, which had reached 188 mm., dropped to 170 mm. She then went abroad for a year. On her return she felt well, but complained of rheumatism in her knees. The blood pressure was 198 mm.; it dropped to 150 mm., where with an occasional treatment it has remained six months.

CASE II.—The patient, who was 52 years old, was seen on January 9th, 1909. She had been taken ill three weeks before, probably with influenza. She had not seen a doctor, but had kept to her bedroom. She was fed exclusively on eggs, caviare, lobster, Brand's essence, and champagne; says she now feels "as weak as a cat." She faints frequently, and is giddy on walking. The periods are irregular. She has for years drunk a quart of champagne daily, sometimes more. She is very tremulous, overstrung, and lacrymose. Heart feeble, slightly irregular, dilated one inch to left. She received twenty-five treatments of high frequency, together with cardiac tonics, Nauheim exercises, and a strict diet.

The systolic blood pressure before treatment was 202 mm.; after treatment it was 140 mm.

After-History.—On February 9th she returned to the country quite well. She comes to town every few months. The blood pressure keeps down satisfactorily. She now takes only one wineglass of champagne a day; says she cannot sleep without this.

Chronic Bright's Disease.

CASE III.—The patient, who was 60 years old and had had two children, was suffering from asthma and bronchitis. She has not been out since an attack of influenza twelve months ago. Sleeps in a small stuffy room with the window shut. Complains of bad headaches and is often giddy. Drinks much tea and stout. Moist râles all over chest; very emphysematous. Heart, liver, and stomach enlarged. Thickish cloud of albumen.

Before treatment the blood-pressure was 258 mm.; after treatmsnt it fell to 168 mm. It required thirty-four treatments to bring it to this; after twenty more it was practically no lower.

After-History.—In November, 1909, the blood pressure was 184 mm.; one treatment reduced it to 173 mm. She kept to her room all the winter; came out for the first time in April, 1910. Blood pressure ranged from 214 to 192 mm. Says she feels well but hates coming out.

CASE IV.—This patient, aged 59, has always had "something": pneumonia twice at school, then pleurisy and bronchiectasis. Has complete transposition of all viscera; is subject to malaria. Comes for Bright's disease; albumen $\frac{1}{12}$. Muscular rheumatism.

Before treatment the systolic blood pressure was 198 mm.; after two months' treatment (twice weekly) it fell to 140 mm.

After-History.—During the subsequent nine months the patient has had one dose weekly; the blood pressure keeps about 140 mm. Feels well, but has occasional rheumatism.

CASE V.—The patient, aged 61, was seen on February 2nd, 1910. Sickness and giddiness had been present for a week. She complained of cough, headache, and lumbago; was feverish at night. One dose of high frequency reduced the blood pressure only from 203 to 202 mm., but the headache and lumbago were relieved, and she could see all round the room, which was previously quite dim.

The systolic blood pressure, which before treatment was 203 mm., after fourteen treatments fell to 140 mm.

After-History.—The patient feels quite well. The albumen rapidly disappeared from the urine and there has been no return. There had been a history of slight albuminuria at times for years.

Lumbago and Sciatica in Gouty Subjects.

CASE VI.—This patient, aged about 60, had had influenza, which left her feeling weak and low, and with sciatica and lumbago. Heart feeble; slight albuminuria.

Before treatment the blood pressure was 192 mm.; after eight treatments it fell to 158 mm.

After-History.—The patient is quite cured. She was placed on special diet, and remains well twelve months after.

CASE VII.—This patient was aged 61, and suffered from lumbago, dyspepsia, and rheumatism. There was slight albuminuria.

The blood pressure before treatment was 184 mm.; after treatment, 135 mm.

After-History.—This patient was cured by twenty treatments. Three months later there had been no return of the symptoms, and she has kept well.

Gouty Eczema.

CASE VIII.—The patient had suffered from attacks of gout and liver congestion once or twice a year for several years, for which I prescribed colchi-sal, and it usually cleared up quickly. One month ago he sprained his ankle. This cutting off his exercise brought on gout in both ankles and in the left knee, with patches of eczema. He received six treatments, which quite relieved all symptoms.

The blood pressure, which before treatment was 165 mm., after treatment fell to 133 mm.

After-History.—Six months later the patient feels quite well; there has been no return of symptoms. Blood pressure, 135 mm.

CASE IX.—The patient, aged 28, was seen in July, 1909. For ten years has had patches of eczema on hands and forearms; never free. Dyspeptic, gouty. On August 30th she was practically well, and going for a holiday.

The blood pressure before treatment was 142 mm.; after treatment, 122 mm.

After-History.—October 30th, cured. Three months later no return; feels well.

Acute Urticaria: Ptomaine Poisoning.

CASE X.—This patient had been under treatment on and off for several years, for slight rheumatism. On the night of June 24th, 1908, she went to the Carlton to supper. At 3 o'clock the next morning she woke with violent pruritus and nettlerash. During treatment the pruritus vanished; there was a slight return the following night, but the next treatment effected a cure.

The blood pressure, which was 142 mm. before treatment, fell to 132 mm. after treatment.

After-History.—Three months later the same thing occurred again. The moment I turned the current on she said she was cured. This *must* have been due to suggestion!

Kraurosis Vulvae.

CASE XI.—The patient, aged 70, was seen in February, 1910. She had had pruritus vulvae since the climacteric, and had lately been getting much worse. There was a patch of kraurosis of about 2 square inches. She also complained of insomnia and dyspepsia.

The systolic blood pressure was 201 mm.; after treatment it fell to 134 mm.

After-History.—In seven weeks the kraurosis had quite gone, and she felt quite well. June, 1910: No return of the kraurosis; the blood pressure still 134 mm.

Climacteric Flooding.

CASE XII.—The patient was 53 years of age; periods very irregular. In July, 1909, there had been flooding for five weeks. The second dose stopped this. The patient had been subject to migraine all her life.

After the sixth dose the blood pressure, which before treatment had been 166 mm., fell to 137 mm.

After-History.—December 3rd, 1909. No period till six weeks ago; flooding since. The period stopped on the fourth day; by the sixth day the blood pressure, which before had been 157 mm., had fallen to 140 mm. January 14th, 1910: Period four weeks, brought on by journey. Blood pressure before treatment 168 mm.; after treatment, 141 mm. June 22nd: No more periods but worry raised blood pressure.

CASE XIII.—The patient, aged 45, was seen in September, 1909. Periods irregular; flushes; insomnia; dyspepsia; headaches.

The blood pressure before treatment was 205 mm.; after treatment, 143 mm. She went home to the country feeling well.

After-History.—The patient returned in February, 1910 There had been a period during the last three weeks. High frequency put an end to the period and acted as a strong tonic.

Blood pressure: before treatment, 169 mm.; after treatment, 151 mm.

CASE XIV.—The patient, aged 51, was seen in September, 1909. She is subject to floodings, which last two or three weeks and completely exhaust her. Heart feeble and irregular; very plethoric. She was greatly relieved by the reduction of the blood pressure, which from being 198 mm., as the result of treatment fell to 140 mm.

After-History.—May, 1910: Patient returned to London in the same condition as before; blood pressure, 201 mm. A course of high frequency relieved the symptoms and cleared her head, the blood pressure now being 150 mm.

Neurotic.

CASE XV.—A widow, aged 58, an actress, was seen on April 12th, 1909. She was intensely neurotic, garrulous, and excited. It was almost impossible to quiet her. She complained of giddiness, constant burning headache, and cold extremities, and that her arms and legs often became numbed. Her nose bled frequently, and she had attacks of diarrhoea and flatulence.

Blood pressure, 256 mm.

After-History.—April 13th to 16th: Blood pressure falling, but the patient was still terribly excited and worried over her affairs. April 17th: Pressure fell of its own accord from 188 to 140 mm.; she was absolutely quiet, serene, and happy; her affairs had taken a pleasant turn. April 18th: Affairs all wrong again; blood pressure rose to 218 mm. She went to the country that night, and had some sort of a seizure, for which the local doctor was called in. He kept her in bed three weeks, and I have not heard of her since.

Methods of Application.

The great trouble in the administration of high-frequency currents has been the want of instruments for accurately measuring the dosage. The dosage of electricity is quite as important as the dosage of drugs. Like them, in some

cases a large dose has precisely the reverse effect that a small one has. The idiosyncrasy of the patients is also as variable.

At first I used about 450 to 500 milliampères from a condensation couch (from the handles of which one obtained a soft spark of about ⅜ in.) alone for five minutes, and then added an effleuve, breezing it all over the patient, especially directing it over the splanchnic area, for another five minutes. Since the invention of Professor Doumer's instrument for measuring electro-magnetic oscillations inside a solenoid I have used this instead, employing 0.028 to 0.03 units for six minutes. It is important to have the cage of adequate dimensions and the wires forming it sufficiently far apart to prevent self induction, or in addition to the electro-magnetic oscillations which produce a fall of blood pressure there will be produced inside the cage a powerful electro-static field which will have the effect of raising rather than lowering the pressure.

A rise instead of a fall is also likely to occur if a longer or a stronger dose be given. In this case the patient may either experience no sensation or else feel a giddiness with headache and sense of fullness. This rise is sometimes followed a few hours afterwards by a fall to below where it was. Great care must be used not to give too long or too strong a dose to old people with high pressure, especially if the heart be feeble.

People with subnormal blood pressure generally find the treatment disagreeable. For instance, I once gave a highly strung anaemic girl (who was accustomed to apparatus, as I was treating her for neurasthenia with static electricity, and who was therefore quite trustful) a local high-frequency breeze on to some chilblains on her toes. Although there was no general connexion, in about two minutes she said she felt faint, and broke into a hysterical fit of crying, which rapidly changed to laughing. Simultaneously she burst into so profuse a perspiration that we had to dry her with towels. Blood pressure 96 mm. Hg.

The day before, Case XII had called, not for menstrual troubles, but also for chilblains. The same dose as was given above—only for longer—had made this lady feel, to use her own expression, "light and exhilarated—it is delicious, and fills one with vitality." Blood pressure 147 mm.

Dr. Samuel Sloan makes use of the resonator effects to raise blood pressure in cases in which it is below normal, and by making the patients rest well before and after treatment gets a rise of 5 to 10 mm. Hg from a single sitting.

Personally, through fear of putting any sudden strain on the heart (which has generally been debilitated in my cases of low tension), I instead have used static electricity for them, combined with tonics, massage, diet, rest, etc.

There is never any measurable change from a single dose of static, but the blood pressure, when subnormal, gradually rises during a course of it. Probably this is part of its general tonic effect, as in cases needing static electricity where the pressure is above normal (140 to 150—not sufficiently high to call for high frequency) it often falls to normal as the patient improves.

Mode of Action of the Currents.

Since so little is known about the physiology of the vasomotor mechanism, the exact *rationale* of the reduction of high blood pressure is still largely a matter of theory.

Vaso-constriction can be produced either directly by substances (for example, pituitary extract) circulating in the blood, or reflexly through the vasomotor nerves.

Almost any source of irritation, mental or physical, may act as a stimulus to provoke reflex vaso-constriction. It may be purely emotional (worry, Case XV), or purely local (pain, Case XI). Cerebral compression, when Nature is endeavouring to keep blood pressure above intercranial pressure, and where relief, of course, can only be obtained with the trephine, acts as the strongest stimulus of all, producing blood pressures of 300 to 400 mm. Hg. These types of case may be considered to be of a temporary nature. When one comes to consider the chronic cases of high blood pressure which one comes across in practice, one finds that the stimulus is a chronic one—namely, *auto-intoxication* from errors in a diet in which the nitrogenous elements are in excess of the requirements of the body and of the powers of elimination of the excretory organs.

Apparently the circulating toxins raise blood pressure:

1. By themselves irritating the nerve endings in the vessels, which reflexly throw the latter into a state of spasm (Russell).
2. By blocking the capillary circulation (Haig).

Here one comes to the whole question of molecular concentration and osmotic pressure, which it is beyond the limits of this paper to discuss. Suffice it to say that with a normally acting heart the capillary reflux is one-twentieth the mid-diastolic pressure. Uric acid toxins circulating in the blood—a condition the amount of which can be estimated by drawing a drop and comparing the number of granules with the number of red corpuscles—retards the rate of flow, and so slows the capillary reflux and raises blood pressure.

The vasomotor spasm will protect the tissues and organs from toxins, and thus prevent the various gouty and rheumatick manifestations which are the inevitable result of increasing accumulations; but at the same time it deprives them of the normal flush of blood necessary to healthy metabolism, and if long continued damages the arteries.

During digestion the vasomotor dilatation in the splanchnic area is accompanied by complementary systemic constriction. Excessive feeding may set up excessive systemic reflex, which oft repeated becomes chronic and so intensifies the action of the toxins.

The fall of blood pressure which occurs from a dose of high frequency must be due to one of three things:

1. Decreased action of the heart.
2. Alterations in the blood itself.
3. Decreased peripheral resistance from the arterio-capillary walls.

1. That the fall is not due to enfeeblement of the heart (as in the action of antipyrin) is shown:

   (*a*) By the sense of stimulation, exhilaration and well-being which the patients experience from the treatment.

   (*b*) By the fact that blood pressure and capillary reflux retain their normal ratio.

2. With regard to alterations in the blood itself we may look upon the action of high frequency in reducing blood pressure as being in some way analogous to the action of a rise of temperature, when, unless there is dyspnoea and cyanosis, the rapid metabolism caused by the onset of any fever is always accompanied by a fall in blood pressure, an increased excretion of uric acid, and a quick capillary reflux—exactly what happens on a small scale with a dose of high frequency.

I might here allude to one or two experiments. If two electrodes from a galvanic or faradic current are placed in a bowl of water decomposition occurs with bubbles of gas at either pole. Even if quite weak, a hand placed between them experiences painful electrolytic sensations. If these electrodes are replaced by high-frequency ones hardly any electrolysis occurs. The water merely gets warm, and a hand placed between them experiences no sensations whatever excepting those of warmth, even with currents so strong that were they galvanic or faradic they would cause chemical and electrolytic changes capable of destroying the tissues.

Placed on each side of a mass of white of egg or a piece of meat, very strong high-frequency currents cause streaks of coagulation due to heat along their line of action. Such experiments indicate that the action of high-frequency currents is to a large extent *thermal*. By special arrangement of application it is possible to obtain local heating only, or to raise the entire body temperature. By means of D'Arsonval's anemo-calorimeter it can be shown that when in the cage the amount of heat given off by the body is increased.

In the entire course of the current we probably augment the normal temperature of the cells and tissues, different centres of heat being engendered in each of the cells according to the specific electrical resistance of each. It is not an increased combustion which secondarily raises the temperature, but a foreign energy has been introduced the rapid oscillations of which cause heat and intense vibratory effects, augmenting the temperature of the cells, and so secondarily increasing cell-metabolism. In a similar way cell-metabolism is increased in fever when

Nature makes a protective effort to stimulate the fires of life in order to burn out invading micro-organisms.

3. *Changes in the Arterio-Capillary Walls.*—In addition to their thermal effects, high frequency currents have definite effects upon the nervous system. They oscillate, however, with such rapidity that no sensory nor motor effects are produced; for all electrical vibrations beyond ten thousand per second lie beyond the limits of the range of frequencies to which these nerves can respond. But though no direct effects can be demonstrated, yet their application to any muscle or nerve does in some way affect it, for it is found afterwards that its excitability to all ordinary electric (galvanic or faradic) stimulation is lessened.

The most noticeable effects which high-frequency currents produce upon nerves are upon those of the vasomotor system, and the splanchnics and the great sympathetic trunks seem to be most sensitive to their influence. Certainly when reducing blood pressure by means of an effleuve, it is concentration over these areas which produces the greatest fall.

Crile has demonstrated that with ordinary electric stimulation of nerves like the splanchnics, which contain both dilator and constrictor fibres, it is always the dilator fibres which respond more quickly, and to currents of weaker strength than the constrictors do, which fact may help to explain the different effects of different dosages of high frequency.

Either the vaso-dilator fibres must be stimulated or else the vaso-constrictor fibres must be inhibited; or else the effect may be partly due to the inhibitory influence (which is possibly comparable to some sort of trophic influence) which these currents have been proved to exert upon all muscles and nerves, lessening their excitability to all ordinary stimulation, and consequently lessening or entirely preventing their response to the source of irritation which is throwing them into excessive action.

Duration of Cure.

This depends upon the removal of the cause. If it be accepted that, in the huge majority of cases, high blood pressure, with all the allied gouty symptoms, can be traced to the presence of toxins in the system, due to a want of balance between the food taken in, the bodily metabolism, and the excretory organs, a real and permanent cure can only be effected by properly adjusting the diet to the bodily requirements.

Given a case where the heart has not as yet failed to the extent of producing dyspnoea and cyanosis, but in which the tissues are loaded up with the products of defective metabolism, producing a state of vasomotor spasm, causing depression, headaches, insomnia, fatigue, irritability, goutiness, and attacks of giddiness, and which, if left to itself, would go on to cardiac or renal failure, high-frequency currents can be relied upon to release that spasm in a satisfactory manner, not only without any ill effects but acting as a stimulant and exhilarant to the patient. There is no drug which can do this. The salicylates and the alkalis are perhaps the most satisfactory, but both are depressing. Mercury and the iodides only act as retentives, storing the products in the tissues for a fresh outbreak later on. Vaso-dilators are transitory in their action, and, if persisted in for long, damage the heart muscle. so that the condition of the patient is worse after than before taking them. I do not wish to imply that electricity can replace these drugs in other conditions, as I constantly prescribe all of them, only never for the specific purpose of bringing down blood pressure.

Having arrived at a healthy state, if the patients can be made to adhere to a suitable diet and mode of life, there is no reason why they should not permanently remain in it.

But, as they are generally people getting on in life, and bad habits are generally pretty firmly established, it is not easy to break them, a repetition of indiscretions cannot be expected to do anything else but cause a repetition of the symptoms. Perhaps the most difficult task of all is to induce middle-aged ladies (who have dropped such a thing for ages) to take exercise.

I always begin by ordering a course of Nauheim exercises with the idea of completely exsanguinating the muscles, so as at least once a day to create in them an absence of any capillary blood pressure. This can lead on to Ling's exercises, and, if possible, to sports, as golf, etc.

In conclusion, I may say that when patients have had a dangerously high blood pressure, the vasomotor mechanism will probably remain hypersensitive for a long while; therefore it is as well to see them again, at least three or four times a year, first, in order to keep them up to the mark with regard to diet and exercise, and, secondly, to measure the blood pressure, so as to be able to check any threatening rise.

TUBERCULIN IN PULMONARY TUBERCULOSIS.

By W. CAMAC WILKINSON, M.D.Lond., F.R.C.P.

[*Abstract.*]

DR. CAMAC WILKINSON said that in testing the value of any system of treatment no experiences and no records were of real value unless these experiences and records had been controlled by yearly examinations for at least three or four years. In respect of sanatorium treatment medical officers of health were among its outspoken advocates. Such officers were not in a position to form any opinion of their own on this problem of practical medicine. Nor should the views of sanatorium authorities be accepted, for they judged mainly by initial results. The right judges were the family physicians; they witnessed the results, whatever these might be, in their daily practice, years after the patients had left the sanatorium. A collective investigation based upon the experiences of such practitioners would establish the real value of the claims made. The speaker himself was a convinced advocate of specific treatment for two solid reasons: First, sanatorium treatment was no ideal treatment, and failed in the majority of cases; secondly, specific treatment could achieve far better results at far less cost and needed no selection of favourable cases to demonstrate its enormous value.

He had seen even very advanced stages of pulmonary tuberculosis complicated with fever and, worse still, with severe laryngeal lesions—even extensive ulceration—yield in a very remarkable way to the action of different kinds of tuberculin; and he had not yet seen an early stage that did not yield more or less promptly to specific treatment without the aid of sanatorium methods, and sometimes even without any suspension of daily work. It could not be that he was a magician, so what he had done and seen could be done and seen by others. Some authorities stated that certain states of health contra-indicated the use of tuberculin, but the speaker knew of only one contraindication, and that was despair. Tuberculin acted like magic in cases of haemorrhage, apart from complications. Haemorrhage might, indeed, be the first sign of a mixed infection, in which case tuberculin would be contraindicated, but by the mixed infection, not by the haemorrhage. Nor was heart disease a contraindication. It might cause pulmonary haemorrhages, and then also tuberculin might not arrest the haemorrhage. He had reported a case of morbus caeruleus complicated with pulmonary tuberculosis—a frequent combination, which he treated with tuberculin. The haemorrhages ceased and the boy put on about a stone in weight and improved greatly in appearance. In other cases of heart disease tuberculin would act just as well upon the tuberculous process as if there were no heart disease, but if the heart disease were of a serious form it might not be wise to use tuberculin, because it might only postpone death, and there was no virtue in prolonging life when life had lost all its uses and was but a living death.

Others, again, urged that neurotic and neurasthenic states rendered the use of tuberculin undesirable and risky. The treatment of all neuroses was difficult, but it was better to save the patient's life than to pander to the morbid tendencies of an ill-nourished—at any rate an ill-conditioned—nervous system, and more than once, by means of tuberculin, he had dissipated to the winds all the symptoms of a marked neurosis. So far he had not had a chance of treating an epileptic. If he refused to treat one it would be because treatment could not make the patient a useful member of society. A neurosis *per se* was no contraindication in his experience, but care should be aken that the mental instability and perversity were not

due to an organic lesion of the brain. If this, however, were a tuberculous lesion, he would use tuberculin. Even the worst complications did not contraindicate tuberculin, especially if they were due to tuberculosis. A mixed infection was one of the worst complications, and might be the prelude of death. But even in some cases of mixed infection tuberculin might be used with benefit. However, on the whole it was better to try and get rid of the mixed infection before tuberculin treatment was attempted. In cases of severe mixed infections treatment in sanatoriums might be indispensable, but, apart from these cases, its value was much over-rated.

In principle there was no difference between tuberculin treatment for the purposes of curing tuberculosis and the use of Haffkine's fluid or similar agents for the purpose of preventing such diseases as plague, cholera, or typhoid. If, therefore, the method was advocated in order to protect a healthy person against a disease which, in a mathematical sense, he had a very small chance of contracting, it was not unreasonable to urge its use if it offered even a small chance of cure to one who had already fallen a victim to the disease. In most cases the work of sanatoriums was patchy and unfinished. Patients were discharged—improved, no doubt, but with the disease still potential, if not active, and merely awaiting a favourable opportunity to assert itself. Moeller, of the Belzig Sanatorium, near Berlin, and a recognized authority on tuberculosis, was ten years ago an utter sceptic on tuberculin treatment, but was now one of its most earnest advocates. He had said that in cases where sanatorium methods had entirely failed tuberculin had been proved to possess undoubted curative properties, and that while sanatorium treatment never cured in three months, permanent cures were often obtained with tuberculin. Strange to say, Dr. Moeller used tuberculin mainly in cases where sanatorium methods had failed, but if tuberculin succeeded where sanatorium methods failed, why should tuberculin fail where sanatorium methods succeeded? Experience had proved to the speaker that tuberculin never failed where sanatorium methods succeeded. In the first stage pulmonary tuberculosis could be cured with certainty by tuberculin; in the second stage, which Moeller maintained was never cured by sanatorium treatment alone, tuberculin gave permanent results in 40 to 60 per cent. of the cases; and even in the third stage it sometimes yielded remarkable results that could not be approached by sanatorium methods.

For the evidence on which the speaker based his views he referred the audience to a book published by him; to the results described by him in a paper on laryngeal tuberculosis read before the Section of Laryngology; to the improvement shown in the blood when examined by Arneth's system in some tables handed round; and to the evidence of complete healing of the lungs after frequent and large doses of tuberculin in a patient who died from an accidental pneumothorax which caused death by cardiac failure.

DISCUSSION.

Professor Sahli (Berne) wished to draw attention to the too little known fact that in addition to lung affections, tuberculous spondylitis, and commencing renal tuberculosis, could be greatly improved by tuberculin given in so small doses that reactions were avoided. He was satisfied that the tuberculin treatment applied in an appropriate manner was a real progress, the greatest progress they had realized during the last twenty years. But it was necessary to treat the cases early. For that purpose it was necessary to make the diagnosis early. In consequence the progress to be realized with the tuberculin would depend essentially on the family physician, who alone got the cases early enough for the tuberculin to play its prophylactic rôle. He had treated thoroughly of the principles of the tuberculin treatment in a small book, of which an English translation of the third German edition would, he hoped, soon appear. He had had one case of Addison's disease which had been treated by tuberculin at intervals during two years. The patient was improving, and he had increased in weight and strength It was to be said that at the same time he used adrenalin in small doses during many months internally, in doses of ½ mg. a day.

Dr. Heron (London) could not agree with the author of the paper in the views there expressed concerning sanatoriums. It was of the first importance in treating a case of pulmonary tuberculosis that, both for his own sake and in the best interests of those with whom he lived, the consumptive should have special knowledge of what he ought to do and also of what he ought not to do. This special knowledge could be best got in a well-conducted sanatorium—excepting, perhaps, in the case of a rich consumptive, who could well afford to get in his own home all that was necessary to the treatment of his disease. For this educational purpose, in the great majority of cases, residence in a sanatorium for at least a month was a most valuable aid to successful treatment. In the public interest it was essential that suitable accommodation should be provided for advanced cases of consumption, where they could be properly isolated and nursed. The view that these advanced cases were most dangerous as sources of infection was held by practically every one entitled to express an opinion about the subject. He did not regard results of treatment as being worthy of serious attention until a period of at least one year had been passed by the patient in which he had, after cessation of treatment, earned his living by his own work. In his opinion the opsonic index had not yet been shown to be of practical importance as a guide to the tuberculin treatment of pulmonary tuberculosis. He had never seen permanent improvement follow the use of tuberculin in far-advanced cases of consumption. The earlier in its history a case of pulmonary tuberculosis was treated with tuberculin the better for the patient. He knew of no drug but tuberculin which exercised any curative influence upon tuberculosis in any of its numerous forms, and he ventured to say that the medical man who did not, in suitable cases, give a tuberculous patient the benefit of tuberculin treatment incurred a grave responsibility.

Dr. Odell (Torquay) said that he could not agree with Dr. Wilkinson in his condemnation of sanatorium treatment. He believed that open-air treatment was of the utmost value, and, from his experience at the Western Hospital, Torquay, treatment by ichthyol, combined with fresh air and good food, had resulted in most satisfactory results. The speaker had used tuberculin when first introduced by Professor Koch, but had not used it for some years on account of the disfavour into which the treatment had fallen, although he had had four successful cases out of thirteen. He came to the meeting with an open mind, and would give the question of tuberculin treatment further consideration.

Dr. Garson (Eversley) traversed the statements regarding the results of sanatorium treatment of pulmonary tuberculosis. The great benefits which patients could obtain in no other way than by residence in a sanatorium were, first, the educational training in the hygienic principles he should follow in after-life; secondly, the medical supervision as to what he might do and what he might not do each day, especially as to the exercises he might take; thirdly, the proper feeding, whereby he received adequate quantities of food and of the various food elements. As regards the use of tuberculin it had been in his hands very effective, especially in the early stage of the disease, in assisting the healing process and of reducing the length of treatment required in a sanatorium. His usual plan was to give it by the mouth, beginning with very minute doses and gradually increasing them; the temperature was very closely observed with the view to regulating the dose so as to prevent any severe reaction occurring from the effects of the tuberculin toxin, which was marked by rise of temperature. Taking the temperature in the rectum was the most reliable method in his opinion in all cases of pulmonary tuberculosis. The opsonic index failed in that it afforded no satisfactory indications for treatment, unless tested as frequently as the patient's temperature. The time required for early opsonic determination rendered this impossible.

Dr. Godfrey W. Hambleton (London) desired to make an emphatic protest against the reintroduction of tuberculin or any similar substance into the treatment of phthisis. The grounds upon which he based that protest were that tuberculin was known to be very dangerous, and it did not produce any beneficial change in the patient's environment; it was based on a misinterpretation of certain experiments on animals, because

the invariable antecedents to the production of tuberculosis were a suitable animal and a certain environment—not the *Bacillus tuberculosis*—and there was not a sufficient amount of identity of relations between those animals and man to warrant or justify the application of an inference drawn from the former to the latter. Tuberculin and all measures founded on that misinterpretation of a great biological discovery diverted the attention from the consideration of the real causes of phthisis and prevented the adoption of practical and effective measures for the prevention and treatment of the disease.

Dr. HALLS DALLY (London) thought the discussion on the value of tuberculin in treatment came at a time which was most opportune, since they might now hope to arrive at some more definite conclusions as to the employment of this remedy. Already many of them were convinced of its great practical value, but, at the same time, he thought that they ought to regard the subject with moderation, and to take care lest by excess of zeal in advocacy they tended to damage the reputation of a remedial agent which, although in his opinion the most serviceable of any yet brought forward, nevertheless should not be regarded in the light of a panacea. With the substance of Dr. Heron's remarks he cordially agreed, the only exception being that he did not regard tuberculin (T.R) as an absolutely harmless remedy which could be given in any dosage with freedom from ill effects. If administered injudiciously he believed it to be capable of lighting up fresh foci of disease in cases which up till then had made favourable progress. In the cases which he had in mind this retrogression might have been mere coincidence, but the onset of fresh symptoms following rapidly upon the exhibition of the tuberculin was suggestive. In selected cases he thought it was most useful, the dosage being calculated by the general condition, temperature, and pulse, which, taken in conjunction, appeared to him to be of more practical value than estimation of the opsonic index. This latter method required not only a laboratory installation, which was not always available, but also considerable experience in technique, in order that the results of the observer could be relied upon. If the opsonic index be taken as a guide, however, he would suggest that a minimum of three controls should be taken in order to determine the normal unit. The object of the administration was to ensure, by graduated dosage, the presence of sufficient protective substances; if few in number, these were augmented; if many, a store was laid up which remained dormant until required, though, if the dosage were excessive or too frequent it might possibly cause an outburst of renewed intoxication. His practice was to begin with small doses, and gradually to feel his way, giving progressively larger doses until a definite effect was produced, when it might be desirable to reduce the amount given, or at all events to proceed with caution. Finally, it appeared to him that in the present state of knowledge the indiscriminate and haphazard use of tuberculin, and, for that matter, of any other vaccine, might be productive of most unpleasant results both to patient and doctor.

Dr. PHILIP (President of the Section) said it would be unfortunate if the impression were conveyed by the discussion that there was an antagonism between treatment on sanatorium lines and treatment by tuberculin. Speaking from a continuous experience of tuberculin during twenty years in hospital and sanatorium, he desired to say that no idea could be further from the truth. Vaccine-therapy and aëro-therapy were not mutually exclusive. The return of the patient to physiological conditions, while possible at home, was rendered easy in the sanatorium. Tuberculin was a specific remedy closely related to the disease, which met the morbid issue directly. Its value and range of application were enhanced when the patient's faulty environment had been corrected. It was likewise undesirable that a feeling should be created by intemperate statement that the advocates of tuberculin conceived no limits to its application. While tuberculin had a large range of applicability in every form of tuberculosis, there were limits. In the case of pulmonary tuberculosis these limits were, on the one hand, physiological, and on the other, anatomical. From the physiological side it would be folly to expect advantage from the injection of tuberculin when saturation of the system by tuberculous toxins already existed. This excluded a large number of advanced cases. No less certainly from the anatomical side there were limitations. It was impossible to expect permanent benefit from the use of tuberculin in presence of pulmonary destruction and excavation beyond a certain degree. They must keep in view that the cure of the local lesion took place by contraction and cicatrization. Contraction had not only to occur in relation to the lung itself, but also in relation to the thoracic wall and adjacent structures. There was a point at which the limits of potential shrinkage of the chest wall, proportionate to the necessary lung shrinkage, were passed. If this point had been reached, or, stated otherwise, if lung destruction were in excess of this potential shrinkage, the value of tuberculin was correspondingly restricted. The action of tuberculin was, therefore, much greater in early cases. Subject to such qualifications, he was satisfied that tuberculin was a specific remedy of first importance, and that, used with knowledge and caution, it was thoroughly safe.

DEMONSTRATIONS.

I.—ON PERCUSSION OF THE VERTEBRAE.

DR. WM. EWART gave a demonstration of the normal vertebral percussion sounds—that is, of the sounds to be elicited under normal conditions from each of the vertebrae by percussing their spinous process, and showed that they could be used for the purpose of diagnosis in two directions: (1) For the diagnosis of intrinsic disease of the vertebrae themselves, and (2) thanks to each of them acting as an insulated pleximeter capable of conducting vibrations from structures in contact with its body, for the diagnosis of a great variety of deep-seated visceral affections not accessible to any other form of physical examination. This implied two stages in the inquiry:

1. A study of the normal individual percussion sounds special to each of the vertebrae; and
2. The study of the clinical inferences to be drawn from any departure from the normal percussion result.

In the course of his remarks he said that *the history* of dorsal plexigraphy, a method practically originated by Piorry (1794–1879), established an essential distinction between "spinal column percussion," which Piorry practised, and "vertebral percussion," which he never attempted; and a further distinction between v. Koranyi's "vertebral percussion in sections" (1906) and "single vertebral percussion," first described in 1899, which was the subject of this paper. Actuality had recently been given to the clinical aspect by J. C. da Costa, jun.,[1] in his paper on The Practical Diagnosis Value of Spinal Percussion in Diseases of the Mediastinum. *The technique* was simple. It was based on the fact that the vertebra acted as a natural pleximeter, and that its pleximetric vibrations were more suitably and successfully conducted through a Sansom's pleximeter than through an interposed finger; whilst they were better elicited by striking the pleximeter with the finger than with a plessor or hammer. Moderate strength of stroke was required for the average of the work, but the strength had to be varied for its details. A rigidly "identical technique" was useless where the material differed so greatly. The percussion was to be strictly localized to the spinous process by the small flange of the pleximeter.

I.—THE NORMAL PERCUSSION VALUES OF THE SEVERAL VERTEBRAE.

Without entering into finer analysis, the individual percussion notes were as follows:

First to sixth cervical: Subresonant dullness.
Seventh cervical and first dorsal: Less resonant than the above.
Second to fourth dorsal: Definitely resonant.
Fifth dorsal ("infratracheal"); Definitely dull.
Sixth dorsal: Subresonant.
Seventh and eighth dorsal ("upper cardiac"): Less resonant than the sixth.
Ninth dorsal ("auricular"): Dullness.
Tenth dorsal ("cardio-hepatic"): Subresonant dullness.
Eleventh dorsal ("hepatic"): Duller than tenth.
Twelfth dorsal ("hepatic"): Duller than eleventh.
First lumbar: Subresonant dullness.
Second lumbar ("pancreatic"): Definitely dull.
Third to fifth lumbar ("intestinal"): Mainly resonant.
Sacral: Of varying resonance.
Coccygeal: At varying times resonant, subresonant, or dull.

[1] *Amer. Journ. Med Sci.*, December, 1909.

The prominent features in the series were:

1. The isolated dullness of the fifth, of the ninth, of the twelfth dorsal, and of the second lumbar spines; and the associated existence (*a*) of a small "infratracheal dull patch," (*b*) of a "left auricular dullness," and (*c*) of a "pancreatic dullness."
2. The isolated resonance of the second to fourth dorsal, and of the third to fifth lumbar, of the sacrum and of the coccyx.
3. The isolated subresonance of the sixth dorsal; of the seventh and eighth dorsal; and of the tenth dorsal ("cardio-hepatic" vertebra).
4. The mitigated dullness of the eleventh and twelfth dorsal ("hepatic" vertebrae).
5. The "lozenge-shaped upper interscapular dullness," the "supracardiac interscapular dullness," and the "post-cordial dullness," all of them relatively, not absolutely, dull, are of great clinical importance. The "paraspinal bands of subresonant dullness" extend the whole way, as originally described by Piorry.
6. The "lower dorsal dull patch" was grafted pathologically in pericardial effusion upon the central hepatic dullness. Normally it was sometimes to be traced in small children as a dulling influence conveyed from the heart itself.

II.—ABNORMAL PERCUSSION RESULTS.

The inferences were mainly surgical or medical, according to the clinical context.

(*a*) The *surgical* question was as to the *intrinsic* dulling of the vertebral note, as evidence of *early* disease of the vertebra itself (tuberculous, cancerous, or inflammatory infiltration, etc.). The later developments were traceable by percussion carried beyond the spinous processes themselves to the paraspinal region.

(*b*) The *medical* diagnosis dealt with vertebrae manifestly free from intrinsic disease, and with their pleximetric conduction of any abnormal dullness arising in the thoracic and abdominal viscera in contact with the deep surfaces of the vertebral bodies. A special inquiry was also directed to the dullness of the spinous processes in pleural effusion (Grocco) and in ascites.

(*c*) New fields for diagnosis by the surgeon and by the physician alike were opened up by "vertebral" percussion in two most important regions inaccessible from the front—namely, *the posterior mediastinum* with its glandular, inflammatory, aneurysmal, tracheal, oesophageal, and other affections, and the no less vital and no less remote "mesenteric" region, in connexion with the varied affections of the central abdominal organs. The examination of the "iliac" region, which was of special importance in these days of *epidemic appendicitis*, belonged to the wider subject of "dorsal" percussion, specially dealt with in a paper read before the Medical Section of the Royal Society of Medicine.[1] An accurate knowledge of the normal percussion note of the individual vertebrae might often afford the means of detecting at an earlier date various centrally-situated affections, for example, vertebral or glandular disease before the formation of paravertebral abscess, oesophageal or tracheal disease before the advent of perforation and of pulmonary gangrene, and biliary, pancreatic, or pyloric disease, etc., before their later stages which alone could yield any definite indications to a physical examination conducted from the front.

II.—AN IMPROVED FORM OF GASTROSCOPE.

MR. SOUTTAR demonstrated an improved form of the gastroscope devised by himself in conjunction with Dr. Theodore Thompson and shown by them last year at the Belfast meeting. It consisted of a long straight limb, with a short nose-piece projecting forwards from this at an angle of 30 degrees. It was indicated that while the instrument was being passed its nose and angle lay snugly in the dorsal concavity of the spine. After introduction the nose lay well forward in the lumen of the stomach and clear of the spine. Its nose could be deflected from side to side by turning the whole instrument, or could be made to rotate independently about its own axis. The joint at which the rotation took place was protected by a rubber band, which also covered as a valve an aperture for inflation.

A window was placed in the side of the nose-piece, and the optical arrangements were such that through this window a very large area of the stomach wall might at one instant be seen in its natural size. Rotation and deflection of the nose-piece enabled all portions of the stomach wall to be brought into view successively. A metal filament lamp of 2 volts provided brilliant illumination and would remain cold for an indefinite period.

The actual nose was of soft rubber and bent easily in any direction. It thus acted as a guide and greatly facilitated the passage of the instrument. It was stated that the instrument, with instructions for its use, could be obtained from Messrs. Allen and Hanburys.

[1] Vol. iii, 1910, p. 211.

III.—THE INFLUENCE OF AIR IN TREATMENT.

DR. LEONARD HILL first pointed out that breathing carbonic acid up to 1 or 2 per cent. was harmless. Experiments of Haldane, Pembrey, Benedict, and himself showed that this was so. He had recently enclosed eight students in a chamber holding about 3 cubic metres (84 cubic feet) with no ventilation. After 45 minutes the CO_2 equalled about 5 per cent. and the wet bulb stood at 85° F. The distress was relieved altogether by putting on a powerful electric fan in the roof and whirling the hot, moist air. The distress felt in badly-ventilated rooms was due to heat and moisture not to chemical impurity. He demonstrated how breathing through a tube increased the pulmonary ventilation; the tube was lengthened by adding segments. The pneumograph showed increasing excursions. He urged that this was a simple, harmless and valuable method of giving respiratory exercise to expand the lungs. Oxygen could be passed into the tube, when a long one was used to ensure a good supply. There was no harm in rebreathing the air like this. He next demonstrated his apparatus by which a bag full of oxygen could be made out of oxylithe whenever wanted. Two blocks of oxylithe were put in the generator (a small metal box), and a pint of water into the rubber bag. The oxygen generated when the water was allowed to enter the box, and filled the bag. A solution of caustic soda was formed, and this absorbed the CO_2 when the subject breathed in and out of the bag. This apparatus had been used with success for mountain sickness, and was good for places where cylinder oxygen could not be obtained. Messrs. Down had made a small apparatus of this kind for anaesthetic use, which he now showed, for oxygen greatly increased the safety of chloroform anaesthesia. He next pointed out that the ordinary method of giving oxygen with a small funnel was of little good. A hospital sister gave him oxygen in the ordinary way, and there was scarcely 1 per cent. more oxygen in his alveolar air. He showed a little light mask made of celluloid, with a detachable and washable curtain which lightly dropped on to the forehead and cheek. The handle formed the oxygen inlet. Using a current sufficient to wash away the CO_2, this mask gave 70 per cent. of oxygen in the alveolar air. An ill patient like a case of pneumonia could tolerate such a mask in comfort, and get much benefit. Playing oxygen near the mouth or into a room were useless proceedings. The fact that the cases of pneumonia in high altitudes must be at once rushed down to the plains, showed the importance of the oxygen supply.

The mask method was too wasteful to be employed continuously. For patients who could bear a mouthpiece he used a big bag fitted with inlet and outlet valves and a tin containing soda lime for absorbing CO_2. This was a very economical apparatus. For ill patients he had made a chamber into which the whole bed could be put. There was a special bellows contrivance and a fan which allowed one to get 50 per cent. of oxygen in circulation through the chamber. There was a window allowing easy access to the nurse. The CO_2 and water vapour were absorbed. With such a chamber the patient could breathe 50 per cent. oxygen continuously. Lastly, he demonstrated the rescue apparatus for use in mines made by Siebe Gorman and Co. He had done much work in perfecting on physiological lines this apparatus which was originally invented by Mr. Fleuss. The man could wear the apparatus and do good work for four hours and be quite independent of the outside air. The apparatus was in use at the Howe Bridge Rescue Station, and some scores of men had been trained in its use. These men breathed oxygen for hours at a time, and there was abundant evidence that oxygen so breathed did no harm. It only increased the efficiency to do rapid work, as in sprint running. High pressures of oxygen produced an acute pulmonitis, but there was no fear of this from breathing pure oxygen for some hours or 50 per cent. as long as one liked.

SECTION OF SURGERY.

Sir Victor Horsley, F.R.C.S., F.R.S., President.

DISCUSSION ON THE OPERATIVE TREATMENT OF SIMPLE FRACTURES.

OPENING PAPER.

By W. Arbuthnot Lane, M.S., F.R.C.S.,
Surgeon to Guy's Hospital, and to the Hospital for Sick Children, Great Ormond Street.

It can be truly said of the treatment of fractures that the evil that men do lives after them, since their patients rarely die. The subject is a very simple one. We have to determine whether the treatment of simple fractures by manipulation, splints, massage, and active and passive movements is satisfactory in securing a useful limb, or whether it is advisable to obtain accurate apposition of fragments and a restoration of the skeleton to its normal form and functions by operative measures.

Personally, I am convinced that in the very large majority of cases of simple fracture of the long bones a perfect result can be obtained by operative treatment alone. However much the bulk of the profession may oppose the operative treatment of simple fractures, the growing demand for a more efficient treatment than the present one will oblige surgeons to improve their technique in this branch of surgery.

That the operative treatment of simple fractures has been opposed so virulently and for so long is merely an evidence of the intense conservatism of our profession and of the great difficulty it experiences in discarding its creeds in the face of proved facts. However, the facts, supported by the growing intelligence and experience of the general public, assisted by radiography and the action of the courts of law, have driven the profession to reconsider their position, and to wonder whether after all the beliefs on which they have based their practice up to the present, to the detriment of their patients, are any longer deserving of credence.

I will first call your attention to the supposed possibility of effecting accurate apposition of fragments and the restoration of a broken bone to its original form by means other than operative. That this should be done has been accepted as a portion of the surgical creed up till quite recently. For instance, the late Mr. Christopher Heath wrote in the *Lancet* of January 4th, 1896, the following:

> I would remind you how important it is in fractures of the leg particularly that the fracture should be set thoroughly and accurately. . . . Unless that is done and done accurately the surgeon has not treated the case properly.

As regards the necessity of obtaining perfect apposition of fragments I am entirely in agreement, and I cannot urge the truth of this teaching too strongly upon you. But as to the possibility of effecting such accurate apposition by the methods usually employed, there is now no doubt whatever that the principle was not and never has been carried out in practice. In fractures of the shafts of the long bones, where there exists any considerable displacement of the fragments, it is almost always impossible to restore the broken bone or bones to their original form by manipulation.

If anyone would still wish us to believe that he is able to obtain accurate apposition by such means let him produce *x*-ray photographs of his cases. That the inability to obtain accurate apposition of fragments is now fairly generally recognized is shown by the fact that the opponents of the operative treatment of fractures have changed their ground. They now assert that the functional result does not depend on the perfection of the restoration of the form of the skeleton, but upon causes which they do not clearly define. These surgeons seem to have a very vague idea of the mechanics of the skeleton. They experience a great difficulty in arriving at a correct conclusion as to the amount of benefit their own cases derive from the treatment they themselves have employed.

The same difficulty does not always exist when they are considering the results of the treatment of others. As an excellent illustration of this, I would call your attention to an address which was delivered by Mr. Clinton T. Dent before the Medical Society of London, published in the *Clinical Journal*, Wednesday, October 7th, 1908. In it he deals with the after-results of fractures of the bones of the leg. I quote from the *Clinical Journal* the following extracts:

> Recovery from the point of view of the surgeon and that of the patient does not always coincide in date. . . . The standard of efficiency is high in the police, the class of men principally under consideration. The work demands fair activity. Thus, for either two periods of four hours, or for one tour of eight hours, a man must be continually on his legs day after day, though with frequent short spells of leave. Judged by this standard and desirous of keeping well within the mark, my estimate is that at least 30 per cent. fail to attain this standard after simple fracture of both bones of the leg; very few regain it under six months. . . . Fracture of the leg, involving the knee or ankle joints, or fractures of the femur uniformly lead to permanent unfitness for the work that devolves on these men; fractures occurring in the neighbourhood of these joints nearly always have the same result. I can hardly recall a case of Pott's fracture or a Dupuytren's fracture where recovery has been complete enough to enable a man to resume police work. . . . My experience with regard to fractures of the leg has led to the expression of rather gloomy, perhaps pessimistic, views.

If these statements of Mr. Dent's are true in the case of men whose duty is merely to patrol the streets, how much more is it true of men whose life depends on the perfect accuracy of their ability to climb ladders, stand on heights, etc. These latter form a very large proportion of our labouring class.

Now contrast this with the following remarks from Sir William Bennett's opening address on the treatment of fractures at the meeting of the British Medical Association in August, 1900, just ten years ago.

> The result of my inquiries in this respect is that I find the real disability following upon fracture is not so great as one would be led to suppose from recent writings on the subject. It is, for example, distinctly stated by a surgeon, who has perhaps a better opportunity for observing badly united fractures and conditions of that kind in sailors of all nations and in all circumstances than perhaps any other, that he had not noticed any particular disability in this class of patient, and that in fact the majority of the seafaring people with whom he has to deal, who have been subjected to fractures, although the union may in the true surgical sense be faulty or even vicious, are able to earn their full pay as ordinary seamen.
>
> The exact words used are as follows: "We see here a great many cases of old badly-united fractures of leg bones, such as those treated at sea, and, after careful inquiry, I have never yet been assured, excepting, of course, cases of greatly exaggerated deformity needing osteotomy, of serious incapacity or of interference with the full discharge of the onerous and active work of a sailor."

These conclusions of Mr. Dent and Sir William Bennett are clearly contradictory, and if Dent's statements are true then Bennett's conclusions are necessarily false. I have no hesitation in repeating the statement contained in a paper I read before the Clinical Society in 1894 which called for Bennett's criticism. In it I urged on the profession the folly of continuing the old method of treatment, and the necessity of having recourse to operative procedures. I stated:

> That the treatment of fractures, as it exists, is a disgrace to surgical practice, because those who have sustained fractures, especially of the leg, only too often experience enormous physical disability. When dependent on labour for their income, they frequently suffer great financial depreciation in their wage-earning capacity. In not a small proportion the depreciation in certain occupations amounts to 100 per cent.

All my subsequent experience of fractures, treated by means other than operative, has fully borne out the accuracy of the conclusions I arrived at many years ago. The advent of *x* rays compelled surgeons to be more careful of their statements as to the necessity of effecting accurate apposition of fragments, and the temptation to cast discredit on the interpretation of *x* rays became too great to be resisted by the surgeon. If these surgeons could have shown that the nature and amount of displacement of fragments were exaggerated by *x* rays, then the surgeons would have believed that they had succeeded in propping up a creed which was rapidly slipping away. Now as far as *x* rays are concerned, when taken by competent operators on up-to-date apparatus, the results are in my experience perfectly intelligible, and give a thoroughly reliable indication of the displacement of the fragments. Far from exaggerating the difficulties of replacement, they often underestimate them very greatly, since they do not

afford any evidence of the soft parts which intervene between fragments and oppose their replacement.

I would therefore assume that the *x*-ray photographs taken in planes crossing each other at right angles by an efficient *x* ray expert with an up-to-date apparatus afford sufficiently accurate evidence of the displacement for the purposes of the surgeon, and also that the same amount of information cannot be obtained by any manipulation of the surgeon, however experienced and skilful.

The advantages gained by operative interference are that the broken bone is restored to its original form and is capable of performing its normal functions. However opponents of the method may argue and attempt to obscure the clear issue before us, there is no doubt whatever that if the operation could be performed easily and safely by an average surgeon the operative treatment of fractures would have become popular long ago. I would again quote from Mr. Christopher Heath's paper as evidencing his confidence in the conservatism of the profession, which has been thoroughly justified by time, namely:

> But I cannot conceive how anybody can believe that it is justifiable to convert a simple into a compound fracture; and of this I am quite certain, that the majority of surgeons for the present will remain content with the usual methods of treatment.

The difficulties that beset the operative treatment of fractures are that to ensure success an asepsis which is much more perfect than suffices for other operations is requisite when a foreign body is left in a wound, as it is in the operative treatment of fractures, and the degree of asepsis requisite varies directly with the bulk of the foreign body. Also, it is not possible to ensure this degree of asepsis and to perform the large majority of these operations with the appliances in ordinary use, and instruments specially adapted for the purpose must be employed. Otherwise we would not hear so much about plates and screws coming out of wounds, of the development of rarefying osteitis about screws, etc.

If infection of the wound takes place, the result may be disastrous to the patient. Many of the operations are difficult to perform, especially when there is much comminution of bone and swelling of the surrounding soft parts, and unless very great care is taken a failure to secure perfect asepsis may arise during the course of a prolonged and complicated procedure. Till this is generally recognized by surgeons, much harm will result from the general use of the operative treatment of fractures, but with an improved technique and an increasing familiarity with the operative procedure the danger of sepsis will cease to exist.

As to the best method of retaining the fragments of broken bones immovably in position, the buried steel plate is, in my opinion, the most effective and simple of application. A plate is readily secured to the fragments by screws, which in the adult engage the proximal compact tissue alone. These are threaded along their entire length. If properly introduced, they produce no irritation in an aseptic wound.

The skin of the patient should be carefully excluded from the wound area by means of sterile cloths fixed to the margin of the incision. The incision should be of ample length, so as to avoid damage to important structures and to minimize any risk of infection. The instruments used for bringing the fragments into position for the introduction of the plates and screws for controlling haemorrhage, etc., should be very long and powerful. No ligatures are required, and no portion of the instrument, sponges, etc, which have touched even the gloved hand should come into contact with the wound. By these means these operations can be performed without any risk of infection or of danger to the life of the individual as far as the operation is concerned.

An epiphysis, if separated, rarely requires to be retained in position by a plate and screws; but should it be necessary to employ such means, the plate should be removed as soon as union has taken place, to avoid any interference with the growth of bone at the epiphysial line. In fractures of the ends of long bones it is also rarely requisite to retain the fragments by means of a plate, once accurate apposition has been effected, provided the joint be fixed in a suitable position.

What are the limits of the operation? It is obviously no use to attempt to retain fragments of broken bones in apposition by any such mechanism as a wire or screw if the texture of the fragment is such that it would not hold. Therefore, in the scrunch fractures of the lower end of the tibia and fibula in feeble old people and in alcoholics, or of the intracapsular fractures of the neck of the femur where no hold can be obtained, any attempt to use these means may be useless or worse than useless. The same applies to the rachitic child in whom the bones are still soft and in whose bones the screws can obtain no efficient hold.

One must always remember that, whatever means are used, it is absolutely requisite to immobilize the fragments. Otherwise, as a matter of course, the condition called rarefying osteitis will take place about the screw or wire perforating the bone. Also it is necessary to so bend the steel plate that it will lie accurately on the bone and will not be separated by an interval. The inaccurate adaptation of the plate to the surface of the bone must necessitate a constant strain on the screws, and this must bend it and force it to assume the outline of the bone to which it is attached.

DISCUSSION.

Professor LUCAS-CHAMPIONNIÈRE (Paris) said that Mr. Lane had demonstrated the safety and utility of his operation. Such a surgical treatment of fracture, therefore, became a useful and correct practice. He did not agree with him, however, as to the generalization of the procedure. Perfection of movement was not generally allied with perfect rectification of the bones. Other conditions must be provided, if the best result was to be obtained. For example, while agreeing completely with him as to certain difficult fractures of the lower part of the leg with great deformity, or the upper part of the humerus, he had frequently demonstrated cases both with slight and severe deformity, in which there was no disturbance of function, and was quite satisfied with the results. As one of the first to advocate suture of the patella, and one who had in fact sutured as many as any surgeon—more than eighty—he had yet never sutured a simple fracture of olecranon, because good and solid results at the end of a fortnight had preserved his patient from an operation. Operation, then, should be exceptional; performed often by certain surgeons perhaps, but certainly not so often by others. Mr. Lane had shown specially two things. First, that an able surgeon like him might operate with perfect safety. Safety was quite necessary. Surgeons had no right to kill a patient who had not death before him. Secondly, he had demonstrated a simple plan for the operation that would be satisfactory for his successors. Even the cases in which he personally did not advise operation had afforded them excellent demonstrations. It would not be possible to have a better demonstration of the importance and usefulness of the method. For a long time yet surgeons would disagree on the treatment of fractures, but all would now be induced to use more frequently an operation such as that proposed, and so commonly performed with success, by Mr. Lane.

Mr. GILBERT BARLING (Birmingham) said that in view of the absolutely contradictory opinions held concerning the disability following fractures—which, on the one hand, was estimated as being *nil*, and in the other as depreciating the usefulness of the patient from 30 to 70 per cent.—the British Medical Association might well appoint a committee to report on the question. The conservatism of the profession was greatly justified by the fact that operative measures implied danger to life in some cases and suppuration with necrosis and delayed recovery in others. Every year saw improvement in method and in asepsis, so that it might be justifiable now to advocate open operation, whereas ten years ago it would not have been so. In view of the revelations made by the *x* rays as to the position of parts in fractures, diagnosis in many parts had to be reconsidered, especially in fractures about the upper end of the femur and in complicated joints like the elbow. The bogey of deformity shown by *x* rays should not frighten a surgeon into operation if he could attain a useful limb for the patient when the bone looked rather ugly by the rays. As to the method of operating, that formulated by Mr. Lane was infinitely superior to others. If a fracture under his care had to be operated on some

weeks after the accident because of deformity and want of union, he felt that there was, originally, want of good judgement on his part. The operation at the primary stage would have given an infinitely better result.

Mr. DEANESLY (Wolverhampton) said it could hardly be disputed that a broken bone treated by non-operative means seldom or never united with perfect apposition. Radiography showed that a variable amount of overlapping or distortion was a permanent result. The practical question, therefore, was this: Was perfect apposition a matter of such vital importance that the ordinary methods of treatment ought to be superseded by more direct and efficient operative means? No candid surgeon could contend that the average results of the treatment of simple fractures by ordinary methods were worthy of modern surgery. The greatest improvement introduced of recent years into the treatment of fractures had undoubtedly been the abandonment of too prolonged immobilization and the use of early movement and massage. By these means much earlier and more perfect restoration of function had been obtained. The non-operative methods of treatment were also capable of improvement, but no improvements were likely to alter the fact that in *certain* fractures perfect apposition was essential to perfect restoration of function, and that there was no means of obtaining perfect, or even approximately perfect, apposition without operation. Speaking generally, results which were practically though not theoretically perfect could be obtained by non-operative methods in the majority of fractures of the upper limb, except those in the neighbourhood of the shoulder-joint and elbow-joint. In the lower limb simple fractures in the middle portion of the femur could almost always be efficiently treated without operation, and with a perfect functional result. Fractures of the femur near the hip or knee joint seldom gave good functional results without operation. The common broken leg below the knee was one of the most difficult fractures to treat. Shortening and distortion were common, and the amount of disability caused was often very serious. These results were not all due to necessary causes, but sometimes to want of skill and experience. Many of them would be better treated by operation, especially those in or very near the ankle-joint. The difficulties and risks of the operative treatment of fractures were neither few nor slight, and must be weighed well against its advantages in a given case. The risk of sepsis was greater than in the majority of operations, and the consequences of even a mild sepsis might be disastrous. At the least it almost certainly involved the eventual removal of the wires, screws, or plates, either by the operator or quite possibly by some other surgeon. Even when the wound healed without apparent infection the metallic bodies inserted often failed to be tolerated permanently, and sooner or later formed sinuses and called for removal. Lastly, the inexperienced surgeon should not imagine that all the difficulties of reducing an intractable fracture disappeared on opening the skin. Operations of this kind called for a very high degree of skill and resource, and even when the difficult job was completed the mended bone required the gentlest handling and the most skilful external support until bony union was some way advanced.

Dr. C. WILLEMS (Ghent) said he was a warm advocate of the bloodless method of treating fractures. In the majority of cases reduction, and maintenance of reduction, should be possible without having recourse to operative interference. The open method of reduction, accompanied by fixation of the fragments, not only exposed the seat of lesion to infection, but in leaving foreign bodies on the surface stimulated rarefactive osteitis, excess of callus, and compression of nerves. Frequently it led to the slow removal of the foreign body. Deplorably slow results from such treatment were known to most surgeons. Instead of directing energies to the perfecting of the technique of fixing fragments, surgeons would be better employed in making themselves conversant with the many varieties of perfect apparatus which had been introduced during the last few years for the bloodless treatment of fractures and with their method of application. Such excellent apparatus, applied with the help of an anaesthetic, made it possible to reduce, and to maintain in reduction, a great number of very difficult cases for which the advocates of the open method deemed it imperative to resort to operation with some mechanical device. In very rare cases operative interference was required:

1. In recent irreducible fractures. In the vast majority of cases true irreducibility was produced by the interposition of muscle tissue, aponeurotic or tendinous material.
2. In fractures which had united in a very faulty position.
3. In certain fractures, either intra-articular or juxta-articular, which required perfect reduction for the normal mechanism of the limb.

In these exceptional cases it was enough to do the operation of open reduction, without using any mechanical device for fixing the fragments. The fragments should be freed and brought once more into apposition. Then, instead of fixing them by some mechanical means, a bandage should be applied to maintain the position. On removal of the obstacle to reduction the fragments remained in apposition quite easily, just as in simple cases where the bloodless method was sufficient. The application of apparatus was a difficult thing when a wound existed, but not impossible. As soon as the reduction was obtained, it should be ascertained which position of the limb yielded the best fixation, and in that position the limb should be held exactly by the assistants. The wound should be closed except for a bit in the middle, and before the dressing the plaster bandage should be applied above and below the wound. Rolled plaster bandages, applied over a simple flannel bandage without cotton-wool, were employed. For example, in case of fracture of the thigh the plaster bandages were carried round the pelvis and the upper part of the limb first, then round the knee, the leg, and the foot. When these two parts of the apparatus were firm, after making quite sure once more that the fragments were in perfect apposition, the wound was closed. A small dressing was applied, and the plaster bandaging completed by carrying it over the dressing. For the success of this method it was necessary to bear in mind that the maintenance of the apposition of the fragments was entirely dependent on the apparatus, and not on the operation. The operation facilitated reduction of the fragments; the plaster maintained the apposition. Without claiming that this method of procedure yielded such mathematical accuracy as that obtained by mechanical fixation of the fragments, such accuracy was by no means necessary for the complete function of the limb. The bloodless method rarely attained such perfection, nevertheless it often re-established function very well. The plaster method should conform to the following conditions: It should be moulded to the limb, involving all prominences and depressions. It should be applied without the intervention of wool, which would eventually shrink and the plaster bandage would no longer maintain the position of the limb. This apparatus should be left in position for a short time; in fact until the callus began to harden, in order that immobilization of the adjacent joints should not be prolonged. On removal of the apparatus, the joints should be moved, and recovery was generally as quick as with the bloodless method. The advantages of this method over that of fixation with mechanical devices, were as follows: The operation was simpler and shorter, and there was less damage to, and exposure of, the parts to infection. The presence of foreign bodies gave rise to excessive callus formation and was not always tolerated indefinitely. Formation of callus was more rapid and the callus itself was of firmer type.

Mr. W. G. SPENCER (London) opposed the general application of the open method to fractures of the shaft of the femur and of the leg, including Pott's fracture. With regard to other parts of the subject—fractures of the patella and olecranon, the humerus in its upper two-thirds, and perhaps some cases about the hip-joint—operation was proper. For fracture of the shaft of the femur it was unnecessary to employ fixation; the long splint with weight extension, increasing until shortening had disappeared, was efficient. One case, in which the femur was telescoped so that the lower fragment protruded by the side of the great trochanter and the lower by the patella, after reduction gave a good result in six months. Two cases which had been treated by the "ambulant" method showed 4½ in. of shortening. One was refractured by osteotomy; the other spontaneously in a fall. After treatment by a long splint and an extension up to 30 lb., with elevation of the foot of the bed, both united well

with ¾ in. of shortening. One recent case had 3½ in. of shortening until 20 lb. of weight had been applied, but union took place without shortening of more than ½ in. Fixation of the femur must rank as a major surgical operation. For young children Mr. Robert Jones's adaptation of Thomas's knee-joint splint was an improvement on the gallows splint. For fracture of both bones of the leg, including Pott's fracture, in his hands no open operation had been necessary; he had succeeded by manipulation, including the division of the tendo Achillis. Cases were sometimes difficult. In a recent case the patient required a brief anaesthetic four times, but a very good result was obtained. As for Pott's fracture, his cases had been reducible under an anaesthetic without or with division of the tendo Achillis. They had not shown, with careful nursing, a tendency to relapse, and they could generally be treated by massage and early movement.

Mr. WHITELOCKE (Oxford) said the treatment of fractures was too often relegated to the care of members of the junior staff of hospitals. In many cases operative treatment was quite necessary. Loosening of mechanical appliances sometimes occurred after the most aseptic operation—it might be even months later. This was not surprising if the pathological dictum were borne in mind, that constant pressure was productive of atrophy. He understood that Mr. Lane now advocated the removal of the plates later in the treatment, lest they should interfere with the growth of the epiphysis, and quite concurred with this necessity. Operation should be performed in all cases of patellar fracture with much tearing of the lateral extensor apparatus, in fractures of the olecranon, and separations of the tubercle of the os calcis. For those fractures he had for years used nothing but the open operation, and with the most gratifying results. At first kangaroo tendon was used as the suture; now, ordinary catgut, prepared either by the iodine or kumol methods. In the long bones, as at the upper end of the humerus, and in the lower third of the tibia or fibula, and in some other situations where much strain was liable to occur, and where there was difficulty in reposition and fixation, Mr. Lane's plates were probably the most helpful. In the future absorbable sutures would be more and more used, as their use was ideal in situations where the strain was not great. The technique was simple as contrasted with the application of wire or other mechanical appliances, and the time involved less. The open operation allowed the surgeon to examine thoroughly the precise local condition of affairs, to reduce the deformity more accurately by removing all interposed soft tissues, such as periosteum, muscle, nerve or blood vessels. In many cases the simple plan of exposing the fracture, clearing away all intervening tissues, suturing the periosteum and overlying muscles, closing the wound and treating afterwards as a simple fracture, was all that was necessary.

Mr. H. J. PATERSON (London) said it was a sign of the times that a subject should be brought up for discussion to which only a few years back reference was made in the columns of the JOURNAL in such terms as "meddlesome and dangerous surgery," an "unjustifiable and unnecessary operation." When any proposal of this sort was brought forward, there were usually two stages in its progress. The first stage, in which men shook their heads, and said that the introducer of the proposal had a "bee in his bonnet"; and the second stage, when every one turned round and said, "this was nothing new, they had been doing it for years." Mr. Lane had survived the first stage. Doubtless, future surgeons would look back and wonder why they continued so long to employ such unsatisfactory appliances as splints. The decision as to the advisability of operative treatment was dependent on the answer to two questions: (1) What were the end results of treatment without operation? (2) What were the risks? In the past too much attention had been paid to the immediate results and too little to the remote; and yet the end results were no less important than the immediate. It mattered little to the patient if he left the hospital with a limb which pleased the surgeon, if, subsequently, he was unable completely to utilize his full working capacity. Mr. Spencer had only spoken of the condition of affairs when the patient left the hospital. What was wanted were the end results. In a paper published in 1909, in the *Annals of Surgery*, two writers gave the end results in over sixty cases of fracture of the femur, and they actually congratulated themselves that only one in three of their patients limped! The seriousness to the patient of impaired utility of a limb was obvious. But impaired utility was a serious matter for the surgeon. They had heard a good deal about good functional results. They must aim at more than this. The objective should be perfection, even if it were not always attained. It must be recognized that the courts of law were not satisfied with good functional results if the *x* rays demonstrated that the anatomical result was imperfect. Referring to results of fractures of both bones of the forearm, followed up some years back, it was found that in no single instance in which there had been a fracture of both bones of the forearm had the patient regained his full range of pronation and supination. Operation taught the difficulty, if not the impossibility, of getting accurate apposition. The displacement found at operation, and the extent to which muscles and tendons were interposed between the fragments rendered adjustment of the fragments in such fractures difficult even by means of an open operation, and impossible without. The results of the operative treatment of these fractures were very different. After operation it was the rule for the patient to regain full range of pronation and supination. A well-known surgeon, alluding to the operative treatment of fractures, had written that in the upper limb a shortening of 2 in. was not of great importance. Had he seen a few such cases in working men, or had such a limb himself, he would not have written such rubbish. What were the risks of operation beyond the infinitesimal risk of the anaesthetic? There was no risk if the operation was carried out as practised by Mr. Lane. To raise such a bogey as septic osteomyelitis requiring amputation, in connexion with the operative treatment of fractures, was utterly ridiculous. It was not a question of an emergency operation. There was ample opportunity to cleanse the skin and to judge of the patient's fitness for operation. To suggest that in operating under these circumstances septic osteomyelitis was to be feared was a suggestion of the surgery of a bygone generation. Operation should be the rule rather than the exception. All fractures of the extremities sustained during the active period of life should be treated by operation, with the exception of fractures of the neck of the humerus or femur, and some fractures without displacement about the ankle-joint.

Dr. CHARLES J. MORTON (London) said he must first of all prove that *x*-ray appearances were not deceptive. He exhibited a femur with a T and an oblique fracture and invited comparison of the skiagrams with the bone. The bone was plated to hold the fragments in position. He demonstrated that the skiagram gave an accurate representation of the fracture, and that, therefore, if skiagrams were properly taken there were no deceptive appearances. This fact was taken for granted in the Radiography Section, but in papers and textbooks it was constantly stated that *x* ray appearances were deceptive. Thus a popular textbook of surgery, by Miles and Thompson, warned the student against relying too implicitly on the evidence that radiography seemed to afford, and went on to state that the shadows were necessarily distorted. Walsham and Spencer again said due allowance must be made for deceptive appearances. There must, of course, be some enlargement, because the rays were divergent, but by making proper allowance for this enlargement, separation, etc., could be estimated to a millimetre. Two views or more were necessary, or a stereoscopic view. Textbooks gave the impression, generally held by the profession, that the treatment of a simple fracture was a simple matter. From the number of badly united cases he saw, he believed that outside the practice of those who used *x* rays in the treatment as well as in diagnosis, the results to-day were no better than those of the early Egyptians as described by Professor Elliot Smith in the BRITISH MEDICAL JOURNAL of March 28th, 1908. [Radiograms of cases treated without *x*-ray control were then exhibited.] Such cases as those he had shown were by no means exceptional; they occurred every day. In the very common fractures.

Colles's and Pott's, reposition of the fragments was the exception, and a stiff joint was the usual result if the displacement was at all marked. Colles's fracture, so-called, was the most common, and probably more mistakes in diagnosis and treatment occurred in this than any other. It was frequently complicated with fissure into the joint. The lower fragment was very frequently rotated back as well as displaced back and impacted; if left in that position malunion and stiffness were the results. The only satisfactory way of treating the fracture of the lower end of the radius was to break down any impaction and lever the lower fragment into position, by operation if necessary, and then treat by free movement and massage. Splints in these cases were not only unnecessary but injurious. An undiagnosed Colles's fracture did better than a recognized and unreduced one with splints. The same might be said of the very frequent fracture of the external malleolus without displacement. In these, again, free and early movement was essential to prevent stiffness, and splints were useless. In Pott's fractures the rotation of the astragalus was to be noted. Fortunately displacements only occurred in half the cases examined, but when displaced he was often asked if operation was necessary. In answering, he had been influenced by the fact that it did not ensure a good result. A second operation was not infrequently required to remove the plates, etc., which caused irritation; again, plates and screws sometimes broke, or wires gave way. He might have been unfortunate, but he had seen a considerable number of these cases and had often wondered if good results could not be obtained by operation and replacing without plates. In deciding the question of treatment, the chief factors from the *x*-ray point of view were, in order of importance: (1) If the fragments were in alignment, or, on the contrary, if there were any angular displacement, affecting the lower extremity, it must be corrected; (2) rotation of fragments in the upper extremities; (3) implication of joints. Of considerably less importance, and depending for this on their amount, were overlapping, separation, and comminution. If excessive they must be reduced, but frequently good functional results were obtained with ½ in. shortening in the leg.

Dr. Shenton (London) said that for many years it had been his daily duty to examine fractures with the *x* rays, and he had had thereby unique opportunities for comparing methods of treatment. As a routine his patients were examined before, during, and after treatment, and in the case of operation it had been customary to photograph before, just after, and at a long interval after operation. The vast majority of patients operated upon were under Mr. Lane's care, and in making comparisons conclusions were based entirely on Mr. Lane's work. In all cases precautions had been taken to exclude distortion and other vagaries of the *x* rays, and the radiograms truly represented the actual conditions present. He photographed his fractures in two planes crossing at right angles, and frequently supplemented this by photographs in other planes to demonstrate particular displacements. The primary object had been to show the maximum displacement before and after treatment. In comparing the results of fractures treated with and without operation the first consideration was accurate apposition of the fragments—a point upon which the radiographic evidence was overwhelming. In the observation of a very large number of fractures it became clear that fractures were practically never replaced in perfect position by external manipulation. Probably it was not realized how little the position of a fracture was affected by external manipulation. Those who had watched their own efforts by means of the *x*-rays screen would bear him out in this. A very ordinary case followed this course: (1) Treatment by manipulation and splinting. (2) Long convalescence. (3) Gradual restoration of function which was rarely complete, followed in a few years by more or less trouble in the nearest joints, due to traumatic or mechanical changes in the joints which had been influenced by the alteration in the axes of the fragments. The joint changes were of importance in proportion to the age of the sufferer. On the other hand, the fracture treated by operation had a short convalescence and rapid restoration of function which in nearly every case was complete and permanent. Cases of simple fracture operated upon at once never returned to complain of joint changes. It was possible that the radiographer saw more of "ultimate results" than the surgeon. A patient might leave the hospital with restored function, but what of the after-changes in joints due to the altered position of the bones from inaccurate position? If apposition was perfect joint changes need not be feared; but unless apposition was obtained there was always a great risk of ultimate trouble. Personal observation extending over a period of thirteen years had quite convinced him that efficient operative treatment gave incomparably better anatomical and functional results than any other form of treatment. The wasting of the bone which took place in all cases of fracture was reduced to a minimum when the fragments were brought into perfect apposition. The period of convalescence was naturally shortened by operation. The formation of callus, which depended not only upon the degree of displacement but also on the degree of mobility of the broken ends, was much reduced. It had been stated on many occasions that rarefying osteitis was at times developed around the screws or plates. In his experience of Mr. Lane's cases no such condition had ever arisen. There was no means so delicate or so accurate for determining the onset of osteitis as the *x*-ray examination. It arose only in cases in which sufficient aseptic precautions had not been taken.

Mr. Ernest W. Hey Groves (Bristol) said it was at present almost impossible to arrive at any exact comparative estimate of the value of operative and non-operative methods of the treatment of simple fractures. The bad results obtained in a large number of cases were due not so much to the methods employed as to the careless or faulty application of these methods. Simple fractures were too often relegated to the category of uninteresting and unimportant cases, and having been once "set" were not further examined, nor the after-history inquired into. Mere skiagraphic delineation of the bones after the healing of a fracture gave no adequate idea of functional efficiency, because apart from mere shortening or angulation, the function of a limb depended chiefly upon the lesions of the soft parts. The bone might be perfectly united but if the nerves were injured or the muscles matted together in the fibrous tissue of the scar the result was bad. On the other hand many cases, the skiagram of which looked very ugly and misshapen had perfectly good functions. As judged by their after-history, cases of simple fracture of the bones of the leg treated by non-operative measures showed very poor results, but there was not yet available a similarly extensive series of cases treated by operative means to effect a just comparison. The point of primary importance was to adapt the treatment of each case to its own special requirements.

Fractures of the Lower Jaw.—For cases of fracture of the body of the mandible, with much separation of the fragments, an enormous variety of complicated splints, both internal and external, had been devised. The multiplicity of such methods proved how unsatisfactory they were. They should be reserved for cases in which an operation was impossible, and direct operative union of the fragments should be regarded as the treatment of routine. The dense substance of the lower jaw was admirably adapted for the fixation by short screws, which need only penetrate the outer table of the bone. A small flap of soft parts could be turned up from the lower margin of the jaw, and a metal plate fixed by screws without opening the septic area of the mouth. It was far easier than the employment of wire, because the wide separation of the fragments necessary to manipulate the ends of the wire on the deep surface involved invasion of the oral cavity. As ordinarily practised, the simple straight division of the bone in Syme's operation for excision of the tongue usually led to non-union. But if the mandible were divided by a <-shaped incision it could subsequently be united by wire, which need only penetrate the outer table in such a way as to give a perfectly firm union.

The Use of Internal Bone Splints.—After an accidental section of the entire diameter of the femur in the operation of osteotomy, instead of leaving a part of its thickness to be fractured, he had found it absolutely impossible to keep the ends of the bone in apposition, and it had occurred to him that the most efficient way of dealing with this difficulty would be to

make a peg which would fit into the medullary cavity of each fragment, and so hold them in line. This was done with complete success. The method proved to be one which had been adopted before, especially in France, but it was hardly referred to at all in this country, and he therefore brought it before the Section. [Mr. Groves then demonstrated some radiograms of cases in which he had employed the method.] This method was especially applicable to fractures of the femur and humerus. The bone splints, of which he showed three sizes, had a small transverse peg to prevent them slipping too far into one fragment. In cases where there was not much comminution their application was exceedingly simple, and could be performed through quite a short incision. This method was very much easier than fixation by wires or screws, and it was based on a much more sound mechanical principle than the latter. When once in place the bone could not be put out of line, and hence, with the use of some simple splint, massage and movement could be adopted within a few days of the operation. The material of the splint was such that it was absorbed and replaced by living tissues.

The Application of Direct Extension by Means of Transfixion of the Lower Fragment—In cases of fracture of the femur, and especially old cases of malunion, this was a method of the greatest possible value which had been extensively adopted in Germany, but which had not met with the attention it deserved in this country. In the thigh of powerful working men the muscular tension was so great that it was impossible very often to produce sufficient extension by external strapping and bandages, and there was always a risk of damage to the ligaments of the knee by bands which had their chief application to the lower part of the leg. In the case of an old fracture with non-union, matters were still more difficult. Direct transfixion of the lower fragment of bone by a long steel needle overcame this difficulty. It could be done through a minute opening, and 20 lb. weight applied in direct extension of the bone. There was far less pain than that with the ordinary method. It was, of course, applicable to the tibia as well as to the femur.

Mr. C. H. FAGGE (London) said that the indications for operative treatment of simple fractures were inability to replace and to maintain in accurate alignment the fractured extremities of any bone; even if replacement was sometimes possible, splint treatment often failed to maintain the good position. The non-operative treatment of Pott's fracture, for instance, had not altered in the last twenty years at least, and he had been much struck by the faulty apposition and bad mechanical results obtained after this injury even by such a master of the common lines of treatment of such injuries as the late Mr. Davies-Colley, than whom no one was more conscientiously careful to supervise the treatment personally and to watch the results for many months; he had also had the opportunity of investigating a series of results of splint treatment of fractures of the shaft of the femur which had been under the care of another of his senior colleagues, who had paid particular attention to these injuries. No doubt in both these instances the results obtained were the best possible at that time, but operative treatment as introduced by Mr. Arbuthnot Lane had now placed a better method in their hands, and it was their duty to aim at getting a perfect result, if possible.

He regretted that some previous speakers should be satisfied by any result which they could themselves only describe as *practically* perfect. Inability to restore the normal outline of the bone must end in shortening and in some deformity, and altered the mechanics of the limb so that often after many months degenerative changes in the adjacent joints were induced; these changes were the cause of persistent pain so often met with after the ordinary splint treatment of fractures, and by which an injured workman was so often gravely depreciated in his wage-earning capacity. Mr. Spencer was either more skilful or more fortunate than the speaker in being able in all cases to obtain good apposition in fractures of the lower end of the humerus in children by fixing them in splints in the fully-flexed position, for the speaker had been called upon to deal with a good number of such cases and had frequently failed with the patient under an anaesthetic on the *x*-ray couch to bring the broken ends together, though this could readily be done by open operation, when the fragments could usually be levered into position with a long bone elevator, and when so apposed would remain in good position without the support of any mechanical appliance; in fact, it was generally inadvisable to insert screws or wire into the growing ends of young bones. He thought that open operation had the advantage of evacuating the blood which had been poured out between the shaft and the detached periosteum, and which often produced later a large amount of external callus, unnecessary in the presence of a plate, and also injurious, in that in many cases it caused harmful adhesions of superjacent tendons or nerves to the underlying bone.

With regard to technique, he had the unique opportunity during the last five years of acting as assistant surgeon to Mr. Lane, and of closely observing and following his methods; satisfactory results could only be obtained by the strictest attention to absolute asepsis; grave mechanical difficulties were met with in the course of such operations, and in all cases elaborate and carefully designed instruments were essential; such procedures could not be carried out by surgeons who had small opportunities for such work, and were not suitable for treatment of fractures in cottage hospitals or country districts; it only did the progress of surgery a disservice to suggest that to plate a fracture was a matter lightly to be undertaken, but at the same time, in capable hands, the risks, such as sepsis, mentioned by previous speakers and writers, should not enter into the question at all.

It was difficult to appreciate the logic of the attitude of the opponents of this method, for whereas, in the words of one of them, they "hesitated to convert a simple into a compound fracture"[1] in the case of a long bone (presumably owing to the risk of sepsis in their hands), they uniformly undertook to carry out an open operation in cases of fracture of the patella and olecranon—in either of which the results of sepsis were, if possible, even more deplorable than after an operation on the shaft of a long bone—with a light-heartedness which some of their results even in the last ten years were scarcely good enough to justify.

He had no experience of rarefying osteitis either among his own or in those of Mr. Lane's cases which he had during Mr. Lane's absence been called upon to deal with; on no occasion had he been called upon to remove a plate or screw from any case of simple fracture, but when in other cases this had been necessary he had been much struck by the firmness with which most of the screws were still fixed in the bone, usually requiring their extraction with the screw-driver. He laid especial stress on this point, as several surgeons in writing or speaking of this question assumed on quite inadequate grounds that after a few days the thread of a screw no longer held, and that it only acted as a peg. He had no knowledge of any fatalities after such operations either in his own practice or in that of his colleagues who carried out such treatment at Guy's. He hoped that this meeting would strongly assert that where ordinary means had failed to restore the fragments in accurate alignment operative treatment should be undertaken without delay, as late operation for malunion or non-union could never obtain a result so perfect without shortening and with the fragments in such good alignment as could be got by operative measures undertaken within a few days of the accident.

Mr. A. S. BARLING (Lancaster) said it might be useful to clear their vision, which had been somewhat blurred by detail, and narrow the field of the discussion. Let it be assumed (1) that the patient was able to stand the operation without undue risk, (2) that the fragments could not be restored to their position by external means, (3) that he had to earn his living by the use of the injured limb. In such a case did this meeting think that they should always operate, and were they prepared to go into court and advise that the patient, if receiving compensation, should have that stopped unless he consented?

Mr. ANDREW FULLERTON (Belfast) said there seemed to be a general consensus of opinion that the surgery of

[1] See Mr. Waterhouse, BRITISH MEDICAL JOURNAL, July, 1910.

fractures had not made the advances that had characterized other branches of the surgeon's art—abdominal surgery, brain surgery, genito-urinary surgery, and orthopaedic surgery, for instance, not to mention the more special departments. Yet the number of fractures compared with other surgical affections was very large indeed. The reason for this comparative want of progress was not far to seek. Not a great deal of interest was taken by the average hospital surgeon of to day in these commonplace accidents. Indeed he often complained that his beds were filled with fracture cases, occupying room that he more than hinted he would prefer to see taken up with more interesting cases. Was it not a fact that they were often relegated to the house-surgeon for treatment, and that the staff surgeon was only called upon when something went wrong? The wholesale condemnation of the older methods affected by some surgeons was not called for. It had only recently been fully recognized that these methods had been imperfectly applied, that inefficient efforts had been made to obtain accurate apposition of the ends of the fractured bones, and that splints had in many cases been kept on too long, with consequent wasting and degeneration of muscles, pressure effects, and adhesions. The common instance was Colles's fracture. There was the greatest difficulty in getting students to understand that splints were simply for the purpose of holding the fragments in position, and that they ought not to be put on with the idea of forcing them into position by their pressure. The fragments must first be manipulated into position. If this were done thoroughly, as it could be done in 99 per cent. of the cases, and if the splints were removed at the end of a week or ten days and properly regulated massage and movements carried out to prevent stiffness and wasting, the patient would be able to return to his work in a month or six weeks with practically no deformity and with good movement. It was astounding to learn that the surgeon to the Metropolitan Police stated that he "could hardly recall a case of Pott's fracture or a Dupuytren's fracture where recovery had been complete enough to enable a man to resume police work." Surely this was not the universal experience of surgeons. What treatment or want of treatment had resulted in this lamentable state of affairs? His experience of fractures of the leg bones had not been that of Mr. Dent. Hundreds of patients in the city of Belfast were working in shipyards and elsewhere after fractures of the leg bones treated by the non-operative methods with no disability whatever. He urged a little more attention on the part of surgeons to these somewhat uninteresting but nevertheless very important cases before adopting a wholesale policy of open operation. With the greatest care and skill, however, cases occurred in which no amount of safe manipulation would reduce the deformity, and in which no apparatus could be found that would keep the fractured ends in position. In these, which were only a small proportion of the whole, some form of open operation must be undertaken. Fractures of the clavicle at the junction of the outer and middle thirds were very unsatisfactory to treat. Sayer's method was the method of choice, and appeared to reduce the deformity at the time. Next time the patient came, however, the deformity had almost, if not completely, recurred. He had not operated on these cases—first, because the deformity, in the male at any rate, did not seriously interfere with the patient's comfort or capacity as a wage earner; and, secondly, because operation left a more or less conspicuous scar, which, while unimportant in the male, was very undesirable in the female. The proximity of the subclavian vein was a serious drawback to the use of plates or screws. There was a transverse fracture of the upper third of the humerus which was very difficult to treat. In some of these cases the upper end of the lower fragment became buttonholed through the periosteum, and lay on the outer or inner side of the upper fragment. This occurred both in children and in adults, and had been treated by sawing off just enough of the lower fragment to allow of reposition. It might be sufficient to sew the periosteum over the replaced ends, or plates and screws might be used. He had had successful cases illustrating both methods. Most cases of fracture at the lower end of the humerus and of the condyles could be successfully treated without operation, but if the deformity was great and could not be reduced, and especially if one or other fragment projected in front, interfering with full flexion, the question of operation would have to be considered. In cases of fractured olecranon with much displacement, wiring was adopted, but if the displacement was slight and the patient a female, mechanical appliances combined with massage could be trusted. Until recently he had advised operation in all cases of fracture of the head of the radius. He had, however, had under his care a case in which perfect movement was restored to the joint after a perpendicular fracture taking off a segment of the head of the radius. The orbicular ligament here acted as a splint. In cases with much displacement he had excised the head of the bone. Fractures of the neck of the radius, if the displacement was marked, were very unsatisfactory to treat, and would in many cases require operation if the patient were to have a useful limb. Fractures of the upper third of the radius with displacement were among the most difficult cases that had come under his notice. Splints, in a bad case, were hopelessly inadequate to control the deformity. In fact, fractures of the bones of the forearm with much displacement were the bugbear of the out-patient surgeon. In many cases the power of rotation was entirely lost, and he had seen non-union occur. He believed the best treatment in these cases was open operation, and had found the plates and screws of Mr. Lane far superior to wiring. Less difficulty was experienced than in wiring, and the fragments were kept more accurately together. The results of manipulation and fixation for a short time in most cases of Colles's fracture were satisfactory. In a few rare cases the question of operation might arise. Fractures of the carpal bones frequently gave trouble. In some cases of fracture of the scaphoid swelling of the joints surrounding the broken bone persisted after rest and massage. Removal of the fractured bone gave excellent results. The removal of a carpal bone was not attended with any interference with the free use of the wrist and carpus. The older methods of treatment in cases of fracture of the metacarpal bones were not quite satisfactory. Frequently the extensor tendons became involved in the callus during healing, and permanent damage to the movements of the corresponding finger resulted; satisfactory extension was difficult to apply. Operation in these cases was often desirable and was not attended with much risk. Similarly with some of the bad fractures of the phalanges. With regard to the risks of operation, while they might be small, even infinitesimal, in the hands of such brilliant exponents as Mr. Lane, other operators did not enjoy the same immunity from disaster. Surgeons attached to large hospitals with well-equipped theatres and abundant help might, perhaps, be tempted to undertake what was quite inadmissible under other less favourable circumstances. All practitioners treated fractures, and, if the practice of operating became universal, the death-rate from these common injuries would enormously increase. It was to be hoped, in the interest of the public, that this debate might have the effect of impressing upon those undertaking operative proceedings that the dangers were neither trivial nor theoretical. One of the most important, if not the most important, of these was sepsis. Sepsis occurring as the result of an operation for fractured patella or fractured femur was terrible to contemplate, and the surgeon incurring this risk had no light responsibility on his shoulders. He would rather open ten abdomens than one knee-joint. There might be some margin left for error in the former, but none in the latter. At the same time surgeons must not be unduly deterred from doing what was right for their patients. The advent of railways, steamships, motors, and the development of electricity had resulted in the death of thousands, but who would go back to the Middle Ages because the risk to life was less in those days? Rather should surgeons endeavour to increase their vigilance so as to be prepared to meet every danger with improved methods of operating and the most minute attention to aseptic details.

Mr. A. H. VERNON (Bournemouth) said the duty of a surgeon, when called upon to attend a fracture, was—at any rate, from the patient's point of view—to "set the bone." If this could be done without operative means, well and good; but, if not, it became the duty of the surgeon to operate and restore the bone, as nearly as possible, to its natural state. The experience of ten years'

work at these operations was that, although not always easy, they had, if conducted properly, most successful results. The secret of success was only obtained by the most thorough asepsis.

Dr. J. Crawford Renton (Glasgow) said he was satisfied that in every case of fracture not easily put into perfect position an anaesthetic ought to be given, and in a great many cases this, with proper fixation and attention to Lucas-Championnière's recommendations, was found to be quite sufficient to ensure good results. Cases of oblique and comminuted fracture were very difficult to keep in position without internal splints, applied as Mr. Lane recommended. X rays and screening had greatly added to the facility with which difficult fractures could be diagnosed accurately, more especially when antero-posterior and lateral photographs were obtainable, and when these means were available they ought always to be used and the results translated by an expert. When they were not available, careful examination under an anaesthetic must be made. When the alignment of a fracture was not satisfactory, and when the bones were not able to be put in good position, with every prospect of obtaining a useful limb, then, other things being suitable, an open operation ought to be undertaken. Since Mr. Lane's methods were adopted, the excellent position into which fractured bones were put and kept was striking. Where the operation was aseptically done, no after-trouble occurred with the steel plates. Sometimes a steel nail had given an excellent result, as in oblique fracture in the lower third of the tibia, as also in oblique fracture of the thigh. It was most unfortunate to keep a patient lying in bed for four weeks where the position of the fracture was not quite satisfactory, in the hope that some sort of union would take place. It was far better to operate at once, and be satisfied that the four weeks were being well spent towards recovery. No one hesitated to use silver wire or steel plates in compound fractures, though personally he preferred silver wire in such cases.

Mr. G. M. Huggins (London) quoted an eminent surgeon to the effect that after much careful thought he had come to the conclusion that simple fractures of the lower extremity, where there was much shortening, should be treated by open operation, but that in the case of such fractures of the upper extremity, where there was not the same need for equality in the length of the limb, the risk of infection should not be taken; they should be treated by the older method. On the other hand, all cases of compound fracture in which there was noticeable shortening of the limb he had no hesitation in advising fixation by wire, screws, or plate. He did not agree with these conclusions, because, in the first place, with regard to simple fractures of the lower limb, it was absolutely wrong to make the amount of shortening the only indication for operation, for some of the worst results were seen in cases where the shortening was very slight or even absent. Witness the so-called torsion fractures of the tibia or tibia and fibula. Treatment of these fractures by the older methods was notoriously unsatisfactory, and often left adduction or abduction of the foot. The difficulty of getting accurate apposition of the fragments even by modern means was great. There was, however, instant return of the foot to its normal relations to the leg as soon as apposition was obtained. Yet in these cases the distinctive feature was the relative absence of shortening. It had been the custom of some of the surgeons on the staff of the Hospital for Sick Children for some years past to operate on simple fractures whenever there had been any chance of improving the ultimate result by doing so. In none of these cases had there been cause to regret the line of treatment, and in no case had there been suppuration, nor had there been any need to remove the plate on account of its causing a sinus. Therefore there was no need for any fear of infection if the surgeon cleaned his hands, wore sterile rubber gloves, and never put his fingers in or near the wound; took care to shut off the skin round the wound by the use of clips and muslin, and never allowed his fingers to touch anything that was going to be placed in the wound permanently such as a screw, or temporarily, such as a mop for removing blood. It was very important not to kill the living tissue cells by means of chemical poisons used for killing pyogenic micro-organisms, which were not there to kill if proper precautions were used. Sepsis was no argument, therefore, against operation in the case of either extremity. Further, many fractures of the upper extremity called for treatment by the open method. Fractures around and into joints must often be treated so of course. There was a specimen in the Royal College of Surgeons Museum added only last year of a fractured humerus in the lower third, with very little displacement and no shortening, yet the musculo-spiral nerve had been involved in the callus. This specimen spoke for itself; it was not a very rare one. The proximity of the musculo-spiral nerve to the lower two-thirds of the humerus was a very powerful indication for fixing the fragments by a plate. Another fracture in the upper limb that called for open operation was a fracture of the radius above the insertion of the pronator radii teres such as occurred from direct violence. In this case the upper end of the lower fragment rode upwards and inwards and could not be dislodged by any manipulation unless the ulna was fractured, and yet unless reduced the movements of pronation and supination were lost for ever. These two instances indicated that there was often no choice as to the line of treatment—it was imperative to operate. On theoretical grounds it was bad treatment to screw, wire, or plate a compound fracture if it could possibly be avoided, and the results of this treatment had been far from satisfactory. In ordinary compound fractures the bone was infected before treatment has commenced, so that in a certain number of cases the resisting powers of the body were overtaxed and the wound suppurated. If a wire or screw were placed through the infected bone, infection was carried into uninfected areas, and the risk of a septic osteomyelitis was increased a hundredfold. There were certain cases in which screw or wire must be used, and in these cases the right line of treatment—having, of course, thoroughly cleaned the wound—was to enlarge it very much and use a long plate, so that the screws might be introduced through uninfected bone, but wherever possible it was better to wait fourteen days so as to operate through clean skin and correct the deformity and fix the fragments with a plate. It should be borne in mind that after the operative treatment of simple fracture, the temperature might go up to 103°, 104°, or 105°, and the highest point might not be reached until the third or fourth day. If the wound were left alone the temperature settled down; if opened up, a permanent sinus might result. A radiogram was just as likely to show less displacement than really existed as it was to exaggerate the displacement. It did not show that jagged piece of bone which was found at the operation, and which had effectually prevented reduction of the fragments without an operation. In conclusion, every case of fracture required treatment with common sense. Some might be treated by splints and massage only with excellent result, but a large and ever-increasing number, as the technique of the surgeon improved, must be treated by open operation to get anything like a good result. Shortening was only one of many indications for operative treatment. In the case of children, at any rate, the fear of infection was no contraindication to operation in the year 1910. A radiogram might be very misleading as to the actual condition of affairs at the site of fracture—it would not show muscle or fascia between the fractured ends.

Mr. Archibald Young (Glasgow) presented a communication, in which he said the use of the term "operative treatment" did not necessarily imply open operation. In spite of what had been said and written by Mr. Lane and others, it must be recognized, and therefore admitted, that there were many fractures which did not now demand, and which could not therefore be justifiably submitted to, open operation. No one could claim that open operation should be the routine procedure to be followed in the treatment of fractures of ribs, of the pelvis—in the absence of complication—of most fractures of the scapula, of most fractures of the clavicle, of many fractures of phalanges, and of a considerable proportion of fractures of the forearm. It might, however, be conceded at once that a very large proportion of all fractures, whether of the trunk or of the extremities, should be examined and corrected under an anaesthetic. This manipulation might be quite justifiably included under the term "operative treatment." While admitting that a very considerable proportion of

fractures of the long bones could only be efficiently treated by open operation, he altogether demurred from the idea that the profession was to be stampeded into the adoption of the position which Mr. Lane appeared to advocate—namely, that all simple fractures must be submitted to the open operation. He took up this attitude, not because he held any specially conservative brief. His own statistics for the last few years showed a greatly increased proportion of fracture cases submitted to operative interference, whether by open operation or merely by manipulation correction under an anaesthetic. Nor did he demur against the whole-hog view of the Lane school from any fear of septic difficulties. The time had long gone past when this might even require to be considered. In his own practice he did not even take the question of asepsis into consideration. He operated on a fractured bone by the open method when the case demanded it. He gave no precedent thought, nor post-operation consideration to how the case would proceed, for he knew all would be well. During the past three years not even the most trifling stitch abscess had occurred in his own hospital practice, and he therefore dismissed this possibility from further discussion. But the very title of the subject brought forward for consideration of itself implied that there *were* cases which did not demand open operation, or even any operation at all. The former he certainly recognized; the latter called for more justification. What principles should guide them in deciding upon open operation? *First of all*, and of chief importance, was the *obliquity* of a fracture. In the leg this was a factor which called for open operation in every case. By this means alone could an efficient result be obtained; by its means an efficient result could be obtained every time. Absolute correctness of apposition, removal of effused blood, freeing of muscles and tendons, and, where necessary, artificial fixation by plates, by screws, by wire, or by other approved means could be assured; and by no other means could these be achieved. Pain was at once relieved, the nursing of the case subsequently was rendered easy, and the period of incapacity was enormously shortened. The same might be said of many, if not all, oblique fractures of the humeral shaft, and of certain fractures at the upper end of the humerus, and of the upper and lower thirds of the femur. He did not at all concede that in these latter situations open operation was the only justifiable line of procedure. Nor did he believe that the open operative procedure was often necessary in most fractures of the humerus near the lower end, whether involving or not the elbow joint. By manipulation under an anaesthetic, checked by the *x* ray screen and photographs, both at the time of operation and subsequently, he had found it possible in a now fairly large number of such fractures, to obtain not merely a most satisfactory and efficient readjustment of fragments at the time, but to ensure a subsequent result in excellent function which could not readily be improved upon. To his mind, the main cause of limited or impaired function following such fractures was to be sought, not in incorrect replacement of fragments, but in the redisplacement of these produced by too early movements of the joint. Reduced and corrected under an anaesthetic, checked at once by radiography, and put up by some such method as Scudder advised and illustrated in his textbook, kept fixed in the position of flexion for at least three weeks, and thereafter allowed almost complete freedom of voluntary (but not of passive or forcible) movement, such fractures of the lower end of the humerus, especially in young people, had, in his experience and practice, given satisfactory results. The cases of this injury which demanded open operation were chiefly those where much extravasation of blood had occurred, whether into the elbow joint or merely into the peri-articular or para-articular structures. This suggested what he would advance as the *second important indication* for the open operation—namely, the presence of considerable *extravasated blood*, especially if accompanied by much comminution of bone or displacement of fragments. The risks here were the production of excessive callus around the site of fracture, even if the fragments were effectively adjusted; and the occurrence of a variable degree of *myositis ossificans* which would deleteriously prejudice recovery of function. Osteoblasts were distributed through the clot and into the surrounding intermuscular and musculo-tendinous planes. The removal of all this clot and potentially ossific or callus-producing material, was most certainly imperatively demanded. *A third guide* to the adoption of open operation was, in his view, the *failure to elicit*, even under anaesthesia, most unmistakable and satisfactory *crepitus*, rough and unexceptionable, such as made quite clear the fact that no soft tissues were between the fractured surfaces. In the case of the femur, for example, failure to elicit crepitus was the chief guide in determining upon the adoption of the open operation in fractures of the shaft. Fractures of the upper and lower ends of the femur came into a quite different category. The tilting of the smaller fragments in these situations was so troublesome as to call for replacement and fixation by open operation in a very large proportion of cases. Frankly, and with all confidence, he confessed that, given good coarse bony crepitus elicited under an anaesthetic, in the average case of fracture of the middle of the femoral shaft he found the method of treatment by powerful and increasingly powerful longitudinal extension, aided by various torsion and transverse extension pulls—the method, in fact, associated chiefly with the name of Bardenheuer—gave results which could hardly be improved upon, if, indeed, they could be equalled by, an open operative procedure, even if this included artificial fixation by plates, screws, wire, or other instrumental means. These were, in his view, three important indications for open operation. They were not all, but they were the chief factors which mattered. He was quite clear that many transverse fractures do not require open operation. He had abundant evidence that it was often quite possible to obtain accurate adjustment without open operation, provided anaesthesia were employed and the correction was checked by radiographic screen or plate. He was equally clear that the correct adjustment so obtained might be quite efficiently maintained thereafter—also by non-operative means. He did not admit that in such transverse fractures, so replaced and so fixed, the period of functional incapacity was any longer than if open operation were adopted. He feared no open operation. Possible sepsis did not enter into his calculations. There were many fractures which he recognized ought always to be dealt with by the open method, but equally he wished to enter his protest against the idea that it was the only justifiable or efficient line of treatment. He had endeavoured to indicate what were the chief considerations which should guide the adoption of the open method. He found no place in his armamentarium for the complicated instruments of Mr. Lane. All he required was a competent assistant (a plurality of competent assistants was even better), simple but reliable bone instruments of the ordinary kind, reliable wire, plates and screws, an efficient bone drill, and a set of screw-drivers. He thought the powerful bone crushing instruments devised by Mr. Lane formed perhaps the least effective argument he could put forward in advocacy of his methods. He had carried out a now pretty considerable number of open operations on fractures, principally of the leg, and had not used them. They seemed to him more like instruments which would find an appropriate place in the tool-chest of a workman on metal, rather than in the instrument case or operation tray of a surgeon dealing with a sensitive living tissue such as bone. He was quite sure, from his own experience, that they were at least unnecessary.

DEMONSTRATIONS.

I.—RADIUM IN THE TREATMENT OF CANCER.

DR. LOUIS WICKHAM, of Paris, gave a lantern demonstration on radium-therapy in connexion with cancer. In the course of it he pointed out that a burning effect, such as was sought by many radium-therapeutists was of little moment, since the same effect was obtainable by other agents. The chief interest of radium lay in its power of selection. Illustrations of this action in the case of cancer were supplied by slides cut from a voluminous tumour of the breast, some at a depth of 3½ in. They showed that the cancer cells were degenerating and being replaced by connective tissue. The operator added that the depth at which radium acted depended on the quantity of radio-activity absorbed. In the case just mentioned 19 cg. of pure radium were applied on the same place for forty-eight hours.

In conclusion, he said that: (1) The excellence of the result depended on the possession of great experience and a large quantity of radium. (2) In the great majority of cases surgery should be associated with radium. If the radium therapeutist was in the presence of a case of grave cancer, he should first consult the surgeon, so that the patient might not be deprived of the prompt help of surgery. If the surgeon was in the presence of a case presenting operative difficulties, he should have resource to the radium-therapeutist to diminish the virulence, and again, afterwards, the surgeon could also in his turn prepare the ground for radium, and his help should be utilized for making the perforation, incisions, and partial extirpations, to diminish the thickness of tumours which the rays had to traverse, or to allow of tubes being inserted in the depths of growths. (3) The tumours must be deluged with rays either by cross-fire action or by insertion of several applicators simultaneously. (4) Like surgery, radium did not affect the general state, neither did it prevent recurrences and metastases. It should be clearly understood that the term "cure" (which should be but rarely used) was only a general way of speaking, and involved a risk of deceiving the patient and the doctor. (5) Even with all its limitations, radium was a precious weapon which should be taken into serious consideration.

II.—A NEW TREPHINE.

Dr. de Martel demonstrated a new trephine with which he said the skull could be perforated very quickly and without danger. It was so constructed that all sawing action ceased automatically as soon as the bone was nearly penetrated. There was a further arrangement in the form of a kind of collar which prevented the trephine injuring the dura mater and underlying brain owing to simple weight and pressure.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CASE OF DISLOCATION OF A SENILE CATARACT.

Mahomed Hassain, a Pathan, age about 50, came to the Church Mission Hospital, Quetta, on July 23rd, 1910, with a senile cataract, dating from three years ago, in the right eye, and a cataractous lens in the left eye, dislocated downwards and inwards, exhibiting oscillation upon movement of the eyeballs and a distinct space between the margins of lens and undilated pupil at the upper and outer periphery. The patient stated that the sight of this eye, like that of the other, diminished gradually, but began four years ago, and that previous to this gradual loss beginning his sight was perfectly good in both eyes. No history could be obtained to account for the dislocation, and apparently this must have succeeded and not preceded the onset of cataract.

The right eye was operated on on July 29th by capsulotomy, and made an uneventful recovery. On August 4th, there being perception of light in the left eye, this also was operated on. After the usual incision and iridectomy the lens was seen to be lying in the posterior chamber free of its capsule, and it was easily expressed by means of a strabismus hook applied upon the cornea. The patient could then count fingers easily, and the pupil appeared perfectly clear.

Tested on August 15th—that is, eleven days after the second operation—the patient could count fingers with the left eye without a glass at a distance of 6 ft., and with a +11 lens at 40 ft., without hesitation, the operation on the right eye being equally successful.

As I am told that what would appear to be a *senile* cataract occurring in conjunction with a dislocation is unusual, I thought it might be worth while to communicate the case.

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Assistant Surgeon.
Church Mission Hospital, Quetta, Baluchistan.

Rebiews.

THE GROWTH OF A GREAT HOSPITAL.

There is one subject which can never fail to be interesting to the student of human nature, and that is the growth of charity, in the modern sense of the word, as a factor of human existence. Nowhere is the contrast between the charity of the past and that of our own times more clearly marked than in the treatment of the sick poor, and this is particularly the case with regard to hospitals, where even the last few decades have witnessed greater and more important changes than in almost any other sphere of human activity. Mr. E. W. Morris's *History of the London Hospital*[1] gives striking proof of the complete revolution which has taken place in hospital administration since the early days of the eighteenth century. The able and accomplished secretary of the "London," in his most interesting and instructive book, has traced the gradual development of this vast hospital from a "little house in Featherstone Street" into the huge block of buildings which to day dominates the Whitechapel Road; and the most salient feature of its whole history is precisely this difference in the treatment of its patients. It is a matter of common knowledge that the sick poor in all our large towns, and particularly in London, suffered severely from the dissolution of the monasteries, where they had formerly found both shelter and medical attendance. Their plight was so pitiful that a very short time after the disappearance of the monks the public was forced to open hospitals especially to receive the sick and dying beggars who lay helpless about the streets. But the generosity of the public seems to have been exhausted by this one effort on behalf of the weaker members of the community, for during the next 200 years little was done to support and improve the hospitals, which soon became indescribably noisome and neglected. The middle of the eighteenth century, however, witnessed a revival of public interest in the disposal and treatment of the sick, and the result was the foundation of a group of hospitals, amongst which was the London.

The London Hospital, Mr. Morris tells us, "is the result of a little meeting of seven men which took place in the bar-parlour of the Feathers Tavern, Cheapside, in the evening of September 23rd, 1740, when . . . a motion was made whether with the sum already subscribed (100 guineas) it would be proper to begin the said charity. And unanimously agreed it was. A hundred guineas!—that sum would to-day 'run' the hospital from breakfast to dinner-time!"

One of the seven men who were present on this historic occasion was John Harrison, a surgeon, to whose untiring and ceaseless efforts the hospital practically owes its existence. It was he who, when, all the necessary arrangements having been made, the whole scheme was about to fall through owing to capital at their disposal being reduced to "only one shilling in the bank," managed to procure ten guineas to carry on the work, together with the Duke of Richmond's promise of an annual subscription. Thanks to John Harrison, therefore, a small house was taken in Featherstone Street at a rent of £16 a year, and the "London Infirmary," as it was first called, was opened on November 3rd, 1740. The number of beds is not known, but there could not have been many, for no nurses were considered necessary, a married couple who were engaged to look after the house also fulfilling the duties of a nursing staff. The hospital staff consisted of physician, surgeon, and apothecary, which posts were filled respectively by Dr. Andrée, John Harrison, and Josiah Cole. Their duty was to spend a couple of hours daily at the infirmary, from 8 to 10 in summer, and from 9 to 11 in winter; whilst the apothecary, in addition, devoted one afternoon a week to "the practice of midwifery and the distempers incident thereto."

From the beginning the new enterprise was successful in every way, though the first secretary abused his trust by

[1] *A History of the London Hospital.* By E. W. Morris, Secretary of the London Hospital. London: Edward Arnold. 1910. (Pp. 296; with 16 pages of illustrations and several plans. 6s. net.)

appropriating £400 out of the hospital funds. Even at this early date it had gained many wealthy and influential patrons, and we may note in passing that in several cases the descendants of these first subscribers still retain an hereditary interest in the London.

An account was soon opened with a banker in Lombard Street, and five months after its foundation, in May, 1741, the infirmary was moved from Featherstone Street to a larger house in Prescott Street, Goodman's Fields. In the following year the first organized appeal for money was made, in which help was asked for "an infirmary set on foot by subscriptions in Goodman's Fields for charitably relieving poor manufacturers, sailors in the merchant service, their wives and children, with medicine and advice in case of sickness or accident."

It was at this date, to all appearance immediately after the removal of the hospital into its new premises, that was formed the nucleus of the first medical school attached to a hospital in London, when Harrison asked permission for one of his apprentices to study in the wards. His request was granted, and six months later this same apprentice took the place of Cole the apothecary, who wished to retire.

The beginnings of the present out-patient department can likewise be traced to this period, for in 1742 "a rule was made that certain diseases which were considered 'unclean' should 'not be taken under the care of the infirmary.' It was agreed, however, that such cases might be *treated*, but not admitted." Also about this time nurses were first introduced into the London Hospital. The first day nurses who were ever appointed were paid 5s. a week and lived outside the hospital; whilst the night nurses received a weekly salary of 3s. 6d. They were, almost without exception, women of the type of Betsy Prig and Mrs. Gamp, and it was no uncommon thing for them to refuse to do the smallest service for a patient without first extracting a "tip." The place of head nurse, called the matron, was filled by the wife of the hall-porter; and the first to hold the office nearly starved the patients and then decamped, after having run up bills at the hospital's expense. The lot of a patient at the London in those days must have resembled that of Gilbert's policeman, inasmuch as it was "not a happy one."

For instance, one pair of sheets only was allowed to each bed, and it seems doubtful if these were ever washed, seeing that the beds were never empty. Cleanliness was so utterly disregarded that in 1770 one of the House Committee reports that "The nurses in New George acquaint me that they have had no water for several days past, pump being as they say out of repair. Ashes has not been cleared away this 2 months which the Cook say blows in at the windows the top of the dust hill being raised above the level of the windows." In 1789 we hear that "there are no towels allowed in any of the women's wards, nor soap for the hands, etc, of any of the patients"; whilst another visitor reports that "the house was very offensive, so much so that I could not Bare the smell!" Long before this remark was made the hospital (after 1747 it was no longer called the "Infirmary") had been removed from Prescott Street to its present site in the Whitechapel Road, then surrounded by open fields. The foundation stone was laid in 1752, but the building was not completed till 1759. "The long time taken in building," says Mr. Morris, "was due to the repeated stoppage of the work from lack of funds." It contained 161 beds at its opening; to day there are nearly 1,000.

It is interesting to compare the difference in the yearly cost of the beds at that period and in our own days. In 1754 a bed at the London Hospital cost £12 a year; thirteen years later it was £17 15s., and in 1822 £26 9s. 4d. To-day some £90 is required for the yearly maintenance of each bed in the hospital. The years following the opening of the new building witnessed many changes and reforms. As late as 1768 "no medical qualification or degree was demanded of gentlemen who were candidates for appointments on the staff"; but at that date it was decided that "no person be in future admitted a candidate for the office of physician until he has been examined by the College of Physicians in London, has their approbation, and has been admitted by them to practise." Twenty years later, in 1785, William Blizard founded "the first regular medical school connected with a great hospital—namely, that connected with the London. The House Committee gave the ground; the building was erected at the expense of some thousands of pounds, chiefly supplied by himself, at a time when he could ill afford it."

Strangely enough "at first Blizard's anxiety to teach in the hospital met with no favour from the committee. He was not allowed to teach on cases *in* the hospital, and, although he was permitted the use of a room for his lectures, he had, at first, to bring his cases with him." It was not for some years, till 1837 or so, that the medical school "seems to have been fairly started," whilst for nurses "there was no proper and systematic training until 1880, when courses of lectures on nursing subjects were commenced by the present matron, Miss Lückes, and, at her instigation, by members of the medical and surgical staff."

No trace of the old London Hospital remains to-day. The whole place has been rebuilt within the last fifteen years, and there can be little resemblance between the original foundation and the palatial buildings which now occupy its site. Everything has changed, even to the types of patient who nowadays fill its wards, and who would doubtless bitterly resent being referred to as "miserable objects," the usual designation of their predecessors. But the charity which helps to maintain this great institution is the same as that which prompted its foundation, and the spirit which animated John Harrison and his colleagues surely exists to-day in those who are carrying on their work.

Among the most interesting chapters in the book are those entitled "The Administration of a Modern Hospital" and "The Future of Voluntary Hospitals." In these a number of questions of the greatest importance are ably discussed. Though we may not agree on all points with the author, his views must be taken into account as being the expression of an exceptionally large experience.

Mr. Morris is to be congratulated upon his "History." Apart from the interest belonging to the subject matter itself, the book should do useful work in giving the general public a glimpse into the workings of a great hospital, and correcting many of the false notions which still linger in people's minds concerning them. The "History" is well bound and clearly printed; and the illustrations, photographs, plans, etc., are not only interesting, but extremely well reproduced.

MEDICINE.

THIS translation of Professor DIEULAFOY'S *Manuel de pathologie interne*[2] is from the fifteenth edition of that now famous work. It is perhaps to be regretted that the translation has been postponed so long, as the veteran professor has passed the meridian of life; and although in some respects his textbook has been brought up to date, that cannot truly be said of it as a whole. This is especially noticeable in the section on diseases of the stomach. Nothing is said about *x*-ray diagnosis; there is no description of Hodgkin's disease, although it is referred to on p. 1833, nor is there any reference to splenomegalic polycythaemia, often called Widal's disease, and there are other omissions. Otherwise it is an excellent book, clearly written and illustrated by admirable diagrams, drawings, and photomicrographs, while the translators deserve praise for their work. Professor Dieulafoy throws Broca overboard, and fully accepts Pierre Marie's position on aphasia, but he does this at the end of a chapter with which it is somewhat inconsistent. Nervous diseases are well done, but on p. 1236, in describing tabes, he speaks of Babinski's sign for the loss of the Achilles jerk, a cause of confusion to readers who are accustomed to hear it used to mean extensor plantar reflex, as indeed Professor Dieulafoy himself uses it on p. 1325. The chapter on kidney diseases is full and interesting, as it is a subject

[2] A Textbook of Medicine by G. Dieulafoy. Authorized English Translation from the Fifteenth Edition of *Manuel de pathologie interne*. By V. E. Collins, M.D.Lond., M.R.C.S., L.R.C.P.; and J. A. Liebmann, Ph.D., M.A., LL.D. In two volumes. London: Baillière, Tindall, and Cox. 1910. (Roy. 8vo, vol. i, pp. 1-1045+xiv; vol. ii, pp. 1045-2081+x; coloured plates, 105. 25s.)

to which Professor Dieulafoy has devoted much attention, We do not agree with him in the importance he attaches to the so-called minor symptoms of Bright's disease, as we believe that they occur in many people whose kidneys are healthy. It is a mistake to say (p. 1090) that Grainger Stewart said that 15 per cent. of all his cases of cerebral haemorrhage had interstitial nephritis. What he did say was that 15 per cent. of his cases of interstitial nephritis died of apoplexy—a very different statement (see *Bright's Disease*, second edition, 1871, p. 235). All the evidence goes to show that the percentage of cases of apoplexy with damaged kidneys is high. Dickinson gives it as 41 per cent., and quotes Ridge Jones's figures, 66 per cent. We have noticed few printer's errors, and there is a well-arranged index. The book is one which all who value the perspicuousness of French teaching will appreciate.

SYPHILIS OF THE NERVOUS SYSTEM.

THE first three volumes of D'ARCY POWER and MURPHY'S *System of Syphilis* were each the work of several writers; the fourth volume[3] is from the pen of Dr. F. W. MOTT alone. The editors and managers of the enterprise are to be congratulated upon the result of their choice of Dr. Mott to discuss the pathology of syphilis of the central nervous system. No more experienced or careful pathologist could have been found: Dr. Mott's volume is a monument of thorough and painstaking research, and affords much suggestive reading for the student who wishes to know the latest views on this singularly difficult and far-reaching subject. Dr. Mott is convinced that the so-called parasyphilitic diseases, such as tabes and general paralysis, are essentially due to syphilis, and holds that the Argyll Robertson pupil or a pupil with an irregular contour (if congenital anomalies can be excluded) almost proves that the patient has had syphilis. Discussing the general pathology of syphilis of the central nervous system, he draws instructive parallels between the lesions caused by Schaudinn's *Treponema pallidum* and those due to other trypanosomes such as *T. gambiense* and *T. equiperdum*. Numerous cases of syphilis of the brain, cord, and meninges are related, with the addition of figures showing the naked-eye or microscopical appearances of the lesions found after death. Dr. Mott lays stress on the association of epilepsy with parasyphilitic manifestations, and supports it by quoting several cases from the literature. In the chapters given to tabes and general paralysis he gives reasons for supposing that both affections are parasyphilitic, although antisyphilitic treatment is more likely to do harm than good; he also comments on the present impotence of treatment of whatever kind in general paralysis. The greater part of the volume deals with the morbid anatomy of syphilis as it affects the nervous system, both macroscopically and microscopically. Dr. Mott has done more original work in this department of pathology than any other man of science, and his careful and cautiously-worded conclusions will, no doubt, meet with general acceptance. His work is illustrated with a number of excellent photographs, and with first-rate coloured reproductions of *post-mortem* material. Special chapters are given to the diagnosis, prognosis, and treatment of syphilis of the nervous system, and to nervous disease in congenital syphilis. The printing and general get-up of this handsome volume leave nothing to be desired; it seems to contain very few misprints and has a good index. A bibliography is given at the end of most of the chapters. Here, perhaps, room for improvement does exist, for the authors are not arranged in alphabetical order, in chronological sequence, or strictly in the order in which they are quoted in the text; further, authors are quoted with the reference "loc. cit." when as many as five of their works have previously been mentioned, nothing showing to which of these works reference is being made. But these trifling imperfections in no way detract from the scientific value of the book, which is indispensable to the neurologist as well as to the student of syphilis.

[3] The Oxford Medical Publications. *System of Syphilis*, in six volumes. Edited by D'Arcy Power and J. K. Murphy, with an introduction by Sir Jonathan Hutchinson. Vol. iv. *Syphilis of the Nervous System*. By F. W. Mott. London: H. Frowde, and Hodder and Stoughton. 1910. (Roy. 8vo, pp. 514, £2 2s. 6 vols. £10 10s.)

NOTES ON BOOKS.

THIS volume on *Childhood*[4] contains twelve short articles dealing with growth, psychology, hygiene, diet, preventable diseases, tuberculosis, alcoholism, physical and mental defect, legal protection, and moral health as affecting young children. The articles are evidently mainly intended for lay readers, and are of varying length and educational value. Taken as a whole, it is an excellent little book for the purpose intended. There is appended for each chapter an exceedingly good list of works for reference and study. Several of the chapters are well worth perusal by the professional man, and the chapter on the moral health of the child, by Dr. Mary Scharlieb, shows deep knowledge of and sympathy with the young child, and could not be too widely circulated among parents and teachers.

The *Omnicert*[5] is the name given to a very convenient little certificate book, which by means of one of two forms contained in the book enables one to certify persons of either sex for inability to work or attend school for any period, or for removal to hospital or infirmary. The arrangement is quite ingenious, and deserves to become popular.

On the first appearance of *Brassworkers of Berlin and of Birmingham*,[6] we made it the subject of an article of some length (BRITISH MEDICAL JOURNAL, February 17th, 1906, p. 385). Since then it has passed through four editions, and has doubtless had a large circulation, mainly, we fear, because its conclusions give support to the views of a political party, but as was well said in the *Times* criticism, which is quoted by the authors in their preface to the third edition: "The chief causes of the better social conditions of the Berlin brassworkers may be summed up in the words, duty, responsibility, discipline, work, order, and method." Its appreciation of modern industrial Germany is confirmed, according to the newspapers, by the report of a much larger body of working men who have recently been to that country on a similar quest of information. There is no political nostrum which can be prescribed to produce the admirable results which visitors to Germany have good cause to admire. These are due to character and conduct, and we can only hope to imitate them successfully in so far as we can correct the defects of duty and discipline, of order and method, which lie at the bottom of the causes of those two obtrusive evils—slum-dwellings and the degraded people who inhabit them.

The Sleeping Sickness Commission of the Royal Society, 1908-09, in addition to their other work, conducted many experiments on the trypanosome diseases infesting the domestic animals in Uganda, and they have now established some of these results in a paper entitled *Trypanosoma pecorum*.[7] The commonest trypanosome disease among cattle in Uganda is caused by a parasite of the dimorphon type, which the authors propose to call *Trypanosoma pecorum*. This parasite when stained is short and stout in form, the posterior extremity being blunt, or rounded, or pointed and angular. The anterior end is narrower. The undulating membrane is fairly well developed, and the flagellum arises near the micronucleus and passes along the edge of the undulating membrane. There is no free flagellum. It sets up a rapid and fatal disease amongst cattle, less so perhaps in sheep and goats, and still less so in monkeys, which usually survive for two and a half months. From experiments made in the laboratory at Mpumu it seems probable that *Glossina palpalis* may be capable of acting as a carrier of this trypanosome, while there is also some circumstantial evidence to show that it may be carried by *Tabanidae*.

[4] *Childhood*. Edited by T. N. Kelynack, M.D. National Health Manuals. London: Charles H. Kelly; The Methodist Publishing Co. (Post 8vo, pp. 152. 1s.)

[5] *The Omnicert*. London: Stone and Cox.

[6] *Brassworkers of Berlin and of Birmingham*. By R. H. Best, W. J. Davies, and C. Perks. Fifth edition. London: P. S. King and Son. 1910. (Demy 8vo, pp. 94. 6d.)

[7] *Trypanosome Diseases of Domestic Animals in Uganda: I. Trypanosoma Pecorum*. By Colonel Sir David Bruce, C.B., F.R.S., Army Medical Service; Captains A. E. Hamerton, D.S.O., and H. R. Bateman, Royal Army Medical Corps; and Captain F. P. Mackie, Indian Medical Service. (Sleeping Sickness Commission of the Royal Society, 1908-9.) Read before the Royal Society, June 16th, 1910.

BRITISH HOSPITALS ASSOCIATION CONFERENCE.

The meeting of this association was held in Glasgow on September 29th and 30th. The association is a resuscitated body, having for its objects the discussion of matters connected with hospital management and affording opportunities for the acquisition of a knowledge of hospital administration, both lay and medical. In the unavoidable absence of the President (Mr. H. Cosmo Bonsor, Treasurer, Guy's Hospital), the conference was presided over by Mr. J. D. Hedderwick, Chairman of the Royal Infirmary, Glasgow, and senior member of the council of the association.

Official Welcome.

Lord Provost M'Innes Shaw, in officially welcoming the members, said that in a city like Glasgow, which saw the birth of antiseptic surgery, and which was associated with the distinguished name of Lord Lister and other physicians and surgeons too numerous to particularize, it would be strange if such an association were not welcome, especially meeting as they did within the precincts of the university that had sheltered and trained men whose names were synonymous all over the world with the highest exemplification of medical and surgical science.

Voluntary Hospitals.

The first subject of discussion was the social policy of voluntary hospitals, introduced by Mr. C. S. Loch, the Secretary to the Council of the London Charity Organization Society. Mr. Loch said that no people were more grateful than members of the Charity Organization Society to hospitals and their staffs for their constant help and advice in cases of illness and distress. The criticism of out-patient departments by medical men and laymen during the last forty years was having its effect. Hospital almoners were introducing a new discrimination and better methods of general assistance. Hospital finance was better regulated and accounted for. And in London they had the King's Fund, which, with the grant of its aids and subsidies, was assuming powers of inspection. Here, then, were indications of a social policy. The questions which he desired to submit were whether consistently with these indications some more definite social policy should not now be developed and accepted by hospitals generally, a policy consistent with the principles of charity and our social and economic knowledge; and if so, what that policy should be. Defining a hospital broadly as a place for the free or part payment of the medical and surgical treatment of poor people, Mr. Loch first discussed the hospital in relation to the medical profession and education. In London there had arisen proposals that were receiving much support for a revision of the method of medical remuneration, and of the system of hospital admissions. In general terms the proposals come to this: That the letter system should disappear; that every patient at a hospital should pay according to his ability; that in what was called contract work medical men should be remunerated for their services according to certain standards accepted by the profession locally; that there should be local provident clubs or dispensaries with which the members of the profession should be associated; that in general patients should be sent to the hospitals (he referred more especially to out-patients) from such dispensaries or from general practitioners; that medical men who took part in the work of the hospital should be remunerated for their work, for, since a payment would be required from the patient when it was right that he should pay, the staff should be remunerated relatively at least. Thus, the outlying gratuitous relief of the hospital would to a large extent be brought into the economic field of normal payment and remuneration. In contrast to that policy was that of the supply of free medical relief at the cost of the State. Next discussing the hospital in relation to the Poor Law and medical charities, Mr. Loch pointed to the change that had taken place in the temperament of the people. The standard of comfort was higher; a claim was made to a yet higher standard. It was a question, indeed, whether in all classes there was not a desire to take out of salaries and wages a higher return in comfort than existing salaries and wages could produce. The word "destitute" had come to be a Poor Law word, and as such had been used in an ill-defined and most exaggerated manner by the Minority of the Royal Commission. All the evidence showed that at a hospital there was a large number of patients altogether above the level of "destitution," using the word broadly. If the difficulties of the situation were to be met, there seemed, Mr. Loch thought, but one way of proceeding—that recommended by the Majority of the Royal Commission on the Poor Laws and Relief of Distress—namely, "that representative medical assistance committees should be established to co-operate, and, when necessary, supplement the medical institutions of the county or county borough, and to support methods of co-operation with the sanitary authorities, etc." In that way a social policy would be carried out which would, consistently with the interests of the medical profession, place accommodation at hospitals and infirmaries respectively within the reach of patients who, paying according to their ability, could on medical grounds be referred either to the hospital or infirmary. The third point in Mr. Loch's contribution to the discussion was the hospital in relation to the individual case and its proper assistance, in regard to which he spoke of the institution of hospital almoners, who would see that assistance was properly given, and that the hospitals were not misused. The policy he had outlined would lead, he believed, as experience had shown, to a better remuneration of medical men, to a better division of labour among institutions for the sick, and to a very serviceable association in charity. It would help the individual physically and morally as, he believed, no other policy could do, for it was based on the principle of a proper treatment of the individual, not as a social item but as a member of a family, and as the member of a society which would have all its members hale and independent.

In the discussion which followed the reading of Mr. Loch's paper, Mr. James Cunningham, a member of the Glasgow Parish Council, said that they were, he thought, all agreed that in many cases medical men acting under the Poor Law authority were not properly remunerated for the work they were called on to do. Mr. Cunningham insisted that there were many people using the voluntary hospitals who should be made to pay something, and he went further and said in connexion with the city health department the hospitals for infectious diseases should not be free to every ratepayer. It was well that they should call very strong attention to the evils attending the State provision of everything for everybody—a tendency which was encouraging thriftlessness and was sapping the whole independence of the Scottish people.

Professor Jones (Glasgow University) said the great social changes expressed themselves in the use of their hospitals. There was a fundamental transformation going on in the use of the medical skill that the community as a whole had at its command. The same kind of change was going on in the organization of labour—the supplanting of individual endeavour by organized endeavour. They could not arrest the development of hospital aid on the ground that it would throw medical men out of work. He thought the question was how far it was possible to extend the infirmary system in such a way as would enable all citizens to make use of them if they desired, and also to pay for them.

Hospital Abuse.

Mr. A. Scott Finnie (Aberdeen) contributed a paper on the abuse of the hospital and its cure. In the course of his remarks he said: In five of the Scottish hospitals the in-patients had increased by 15,569 in twenty years, while the out-patients had increased more rapidly. The advances are suspiciously suggestive of an abuse of charity. Of course there were people who were in-patients who were able to defray the cost of their treatment elsewhere. What is needed is the reorganization of charitable medical relief on a plan which would to the fullest possible extent conserve the interests of the really poor and deserving, under which those partially, but not wholly, able to provide for themselves would be assisted in the manner best calculated to preserve their independence and self-respect; and also under which the members of the medical and surgical staffs should feel that they were neither bestowing their generosity on the undeserving, nor indirectly contributing to the impoverishment of their professional brethren, the general practitioners. The enunciation of some general essentials of reform seems more appropriate to the present

occasion than any attempt to arrive at agreement on minute details. Among the first is uniformity of practice in all hospitals engaged in similar work. It would greatly help if a scale of maximum fees for the treatment of particular ailments could be adopted. By this means the approximate cost of treatment, either at a patient's own or a nursing home, could be readily ascertained. The eligibility of applicants would then be determined upon a comparison of financial position with probable cost of private treatment.

Dr. DEWAR (Edinburgh) said hospital abuse was very prevalent in Edinburgh, and had been for some time. He detailed the action taken by the combined Divisions of the British Medical Association in Edinburgh to combat the mischief being done to the charitable public and the medical profession. The result of the agitation was the movement to erect a paying hospital, for which they aimed at raising £10,000, and which would be a boon not only to Edinburgh but to the East of Scotland.

Mr. J. A. ROXBURGH (Glasgow Western Infirmary) said there was no abuse of the hospitals in Glasgow. A proposal to have paying wards in the Western Infirmary had been discussed and found unworkable. All were agreed as to the need for paying hospital accommodation, but until they revolutionized the present system they could not have free and paying wards in the same hospital.

On the second day Mr. J. A. ROXBURGH (Glasgow) presided at the outset, the chair being afterwards taken by Mr. J. D. HEDDERWICK, Chairman of the Royal Infirmary, Glasgow.

A Unified County Medical Service.

In the absence of Mrs. Sidney Webb, Dr. D. J. MACKINTOSH, Western Infirmary, Glasgow, read her paper on "The Coming of a Unified County Medical Service. and how it will Affect the Voluntary Hospital" Mrs. Webb, in the course of her paper, said that the Royal Commission on the Poor Law brought out very forcibly three facts: First, that our Poor Law and our pauperism (on which we were this year spending out of the rates and taxes of the United Kingdom close upon £20,000,000) was to the extent of at least one-third, and perhaps one-half, dealing with the destitution of people stricken with preventable sickness, which we were to-day not preventing. Secondly, that in our public arrangements for dealing with sickness we had got into a muddle far greater than was commonly realized of duplicated services, rival authorities, overlapping of work, waste of public money, and confusion of principles. We maintained on the one hand an ubiquitous rate-supported Poor Law medical service, with 4,000 badly paid Poor Law doctors, forbidden to treat sickness unless and until it was complicated by destitution, and then charged to give "medical relief"; on the other hand, an equally ubiquitous, rate-supported public health medical service, with several thousand doctors, nurses, health visitors, etc, now dealing largely with the very same diseases as the Poor Law medical service, but on the diametrically opposite principle of "searching out" the incipient case, and treating yearly some hundred thousand or more of patients from the standpoint not of relief but of prevention. Thirdly, that, notwithstanding the ubiquitous existence of these two rate-maintained medical services and public hospitals—notwithstanding also the co-existence of more private medical practitioners than ever, and of a bewildering host of medical charities in the form of voluntary hospitals, dispensaries, convalescent homes—an enormous amount of illness went untreated. Such being the case the nation had before it the customary three courses. We might do nothing, or next to nothing, in the way of reform. There is, secondly, the policy of "one authority, and one authority only, for all necessitous persons." Finally, there was the policy of breaking up the Poor Law into its constituent services and transferring each of these services to the rival department that was actually already in existence for dealing with that particular section of the population. Continuing, Mrs. Webb said that she did not think it needed much gift of prophecy to see that, sooner or later, it was the last policy, which was that of the Minority Report of the Poor Law Commission, that was destined to prevail. Mrs. Webb proceeded to discuss the question of how the coming of a unified county medical service would affect the voluntary hospitals.

Considerable discussion followed the reading of Mrs. Webb's paper and also on the papers read on the previous day by Mr. Charles Stewart Loch and Mr. Scott Finnie.

Mr. MOTION, Clerk of the Glasgow Parish Council, considered Mrs. Webb's conclusions were principally drawn from her experience of England, of which he did not presume to speak, but applying the same opinion to Scotland was, he thought, very wide of the mark. The Poor Law medical service in Scotland did not deal with the same diseases as the Public Health Department. He hoped that the Minority Report would never be adopted in this country, where the local administration had all along been ahead of the sister country.

Councillor MACPHERSON (Edinburgh) drew attention to the great abuses which were found in connexion with voluntary hospitals. The abuses consisted in a great many well-to-do selfish citizens who were well able to pay for their own medical treatment and hospital assistance, taking advantage of the contributions of the charitable public.

Dr. ROBERTSON (Leith) and Dr. NATHAN RAW (Liverpool) also spoke.

Dr. D. J. MACKINTOSH (Superintendent, Western Infirmary, Glasgow) said that they could not look at this hospital question entirely from the side of the medical profession. He agreed that every medical man should be paid adequately for whatever he did; but they must not view too narrowly what was said to constitute abuse in the use of hospitals as long as they did not make any other provision for the middle class. As a superintendent of a hospital he was quite prepared to say that the bulk of the cases that one might regard at first glance as unsuitable for an ordinary charitable institution were sent by the medical men themselves; and he did not blame them, because they were in the best position to judge whether the cases could be better treated in the hospital. There was no abuse until they made provision for the middle class for such special treatment as the poor and the rich had.

Professor GLAISTER would be sorry if the day should ever arrive in this country when the voluntary hospital should be put down or discouraged.

Institutional Treatment of Tuberculosis.

Dr. NATHAN RAW (Liverpool) read a paper on institutional treatment of tuberculosis, in which he said it was absolutely vital to the scheme of prevention that all consumptive children should be removed from the ordinary schools and treated in special open-air schools. All the voluntary hospitals in the country should take their share in the treatment of consumption. He said that it was absolutely necessary that some simple and inexpensive institution should be provided where advanced cases could be received until the end. They were the chief means by which the disease was spread to healthy persons, and should be removed from their poor homes, by compulsion if necessary.

Dr. EBENEZER DUNCAN (Glasgow) said in the Victoria Infirmary there were two wards for the open-air treatment of phthisis, and he thought the principle might be very much extended to the hospitals in Glasgow.

A paper was read by Mr. NICOL BROWN (Chairman of the Council of the St. Andrew Ambulance Association) on What are the best ambulance arrangements for hospitals? and Is the motor ambulance quite reliable? In the discussion which followed most of the speakers dealt with the advantages of the motor over the horse-drawn ambulance.

Private Rooms in Fever Hospitals.

Dr. EBENEZER DUNCAN (Glasgow) spoke on another question suggested for discussion, "Should private rooms be provided in fever hospitals for patients who are prepared to pay for them? Can they be attended by their own medical man?" He said that they ought to have paying patients in their hospitals. He did not see any reason whatever why if a person went into a hospital and got a private room the family doctor should not be permitted to attend.

Election of Office-Bearers.

The office-bearers were re-elected as follows: *President*, Mr. H. Cosmo Bonsor, treasurer, Guy's Hospital, London; *Honorary Treasurer*, Mr. Conrad W. Thies, Royal Free

Hospital, London; *Honorary Secretaries*, Mr. William West, London, and Dr. D. J. Mackintosh, Glasgow.

The conference closed with votes of thanks.

Visits to Hospitals.

Visits were paid during the conference to the Western Infirmary, Royal Asylum, Gartnavel, Royal Infirmary, the Maternity and Women's Hospital, and the Victoria Infirmary.

Luncheon.

The members of the conference were entertained at luncheon by the directors of the Western Infirmary and the Corporation of Glasgow.

It was agreed that this fresh conference marked the successful inauguration of what should prove a profitable series of annual meetings. The subjects discussed were not only of interest to the medical profession and those connected with hospital administration but of great general and educative importance.

Nova et Vetera.

JEWISH DOCTORS IN THE MIDDLE AGES.

OUTCASTS as were the Jews in every European country during the whole period of the Middle Ages, there was always one profession in which they were recognized as the equals, and in many cases the superiors, of their persecutors. That was the profession of medicine. They did not, however, gain this position of equality without a struggle. It is true that the mass of the people appear always to have reposed a peculiar confidence in the knowledge and skill of the Jewish doctor; but the practice of calling in a physician belonging to the Chosen People was discouraged by the Church, which regarded any *rapprochement* between Jews and Christians as undesirable, if not actually dangerous. Again and again in the thirteenth and fourteenth centuries the French ecclesiastical councils forbade any Christian, under pain of excommunication, not only to consult a Hebrew practitioner, but even to take medicine prepared by him. The fulminations of the Church, however, seem to have had very little effect. In the opinion of Dr. P. Pansier, of Avignon, who published in the July number of *Janus* an article on "Les Médecins Juifs à Avignon aux XIII^me^, XIV^me^, et XV^me^ Siècles," these fulminations were inspired not by fear of the spiritual dangers arising from the contact between Christians and Jews, but by the dread lest the medical profession should degenerate into a happy hunting ground for members of the latter race. This was by no means a remote contingency, especially in the South of France, where the Jewish element in the profession was particularly strong in mediaeval times. From very early days a Jewish school of medicine had existed at Lunel, near Montpellier, and to use Dr. Pansier's expressive words, it had "flooded the south with its physicians." Some of these even taught at Montpellier, where the faculty, in certain cases, granted them a licence (*magister in medicina de Montepessulano*). The extent of the popular faith in the Jews as physicians may be measured by the fact that, notwithstanding the threat of excommunication, nearly all the great nobles went to them for advice in preference to Christian practitioners, some of them going so far as to appoint Jews as their household physicians. Even Alphonse de Poitiers, the brother of St. Louis of France, when suffering from eye trouble, did not hesitate to consult Habrahym, a Jew of Aragon. The Jewish physicians became so numerous in the fourteenth century that the Church was obliged to mitigate her laws concerning them. In 1341, at a synod held at Avignon, it was decided to raise the interdict against them in consideration of the fact that "at the time when this prohibition was made there was a great number of Christian physicians; but they were now so greatly diminished that the sick who wished to obey the laws of the Church and refused to be treated by Jewish doctors were unable to obtain any medical aid at all." This declaration marked the commencement of the golden age of the Jews in Avignon, which lasted over a century. During that period even the convents were under the care of children of the Ghetto; the convent of the Cordeliers, for instance, had as its medical attendant the Jew Abraham de Carcassonna, who received the princely salary of 4 florins a year. This same convent in the course of one century had four different doctors, of whom three were Jews. Later the Jewish doctor played a prominent part in looking after the plague-stricken patients during the epidemic which raged at Avignon during the latter years of the fifteenth century. Curiously enough, however, those attached to the hospitals at this time were not so well paid as the Christian doctors, the latter sometimes receiving as much as 12 florins a month, whilst their Jewish colleagues only had 9 or even 6. It is at this period, and with regard to a Jew, that we have an interesting glimpse of the system of quarantine as it was practised in the Middle Ages. One Léon Botarel had been engaged by the town authorities to treat sufferers from plague either in hospital or in their own homes; and besides the salary of 17½ crowns a month allotted him, and the fees he was allowed to take from rich patients, he was given free quarters in the Ghetto. By the terms of his agreement, however, he had to bind himself, when the epidemic ceased, to endure a month's quarantine, which he was to spend shut up in his own house. The relations between Jewish doctors and their Christian *confrères* appear to have been quite friendly, and the same may be said with regard to their patients. Many of the former managed to amass large fortunes, but this was not by the exercise of their profession alone. True to the instincts of their race, the Jewish physicians frequently carried on a thriving trade as merchants or usurers, assisted, in many cases, by their wives. It was not until the fifteenth century that the Christian Jew appears as practising medicine in Avignon, but even then there were still many countrymen who preserved the faith of their forefathers. Their glory had departed, however, and the opening years of the next century witnessed a notable diminution both of their numbers and their importance, and in 1555 a Bull was issued which forbade Jews to practise medicine either in Avignon or in the Comtat Venaissin. Later, whoever wished to receive the degree of Doctor of Medicine was obliged to make a profession of orthodoxy—a fact which explains the total disappearance of the Jewish practitioner in the seventeenth century. The reason of the Jewish physician's marked success in his profession is not far to seek. In the thirteenth and fourteenth centuries he was far superior in every way to his Christian colleague. At a time when the line was very sharply drawn between physicians and surgeons, when the physician knew nothing of surgery, and the surgeon nothing of physic, the Jewish doctor had studied both and practised both indiscriminately. Moreover, unlike the Christian physician of that period, the Jew did not disdain to enter into the smallest and most unpleasant details concerning the workings of the human body: and as a natural result the Jewish portion of the medical profession was, on the whole, far the ablest and most efficient. Another point to be observed with regard to the Jewish doctors of that time is that they frequently came of medical families. In such a case the son learnt his profession from his father; where this was not possible, the Jewish student was apprenticed to some practitioner of his own race. Dr. Pansier quotes a fifteenth century contract which may serve as an example of the usual sort of agreement made between master and pupil. It is dated June 25th, 1472, and is drawn up between two Jewish surgeons, Jessé Ferrussol and Jacob Léon de Cavillon, of Avignon, and their fellow-countryman, Antoine de Bale, by which the latter agrees to spend a year at their school, where he is to go through a course of medical literature, three books being specially mentioned. These are: (1) The work known by the name of

Lanfranc, (2) Maitre Guy de Chauliac, (3) the fourth part of Avicenna. For these privileges the father of the young apprentice had to pay three golden crowns. One of the most interesting points of Dr. Pansier's article is his exposure of an old fallacy. It has been long believed that the Popes, during their exile at Avignon, had Jewish physicians in their service. This, as Dr. Pansier points out, was clearly impossible, since the Pope's doctor was likewise his chaplain, and nominated by a Papal Bull, which could not be accorded to any one outside the Church. The only foundation for this belief appears to rest upon the fact that Benedict XIII had as medical attendant Joshua Lurki, an Aragonese Jew; but it is apparently forgotten or not known that not only was this long after the Papacy had returned to Rome, but al o that Lurki had renounced his own faith and become a Catholic under the sonorous name of Hyeronimus de Sancta Fide.

OPENING OF THE WINTER SESSION IN THE MEDICAL SCHOOLS.

DURING the past week the doors of nearly all medical schools and faculties have been reopened, both in London and in the provinces, and work for the winter session is now in full swing. This year a prize-giving ceremony has marked the beginning of the winter session at a rather larger number of schools than usual, and a tendency is also evident to return to the custom of giving in one guise or another an introductory address. Practice, however, in this direction shows a constant tendency to vary. At some of the principal schools work has been recommenced without any ceremony whatever, but at most institutions the beginning of the winter's work has been marked by the holding of an assembly of old students, if in no other way. When addresses were delivered some reference to their contents will be found in the following paragraphs under the title of the hospital to which the school at which they were delivered is attached, while several of them appear in full in the earlier pages of this issue. Pressure on our space renders the holding over of a certain number of accounts until next week a matter of necessity.

ROYAL FREE HOSPITAL.

No school gatherings are better attended than those of the London (Royal Free Hospital) School of Medicine for Women, and the inaugural ceremony this year lacked nothing of its customary animation. It took place on Monday, and consisted, as usual, in the giving of a short account of the position of the school and of its prospects, and in the delivery of a formal address, followed by a tea party and a general exploration of the school premises. Mrs. Garrett Anderson, M.D., president of the school, took the chair, and received, as usual, a very warm greeting. She was able to give a very satisfactory account of the school, and to show that everything points in the direction of the continued and increased prosperity of this institution. The number of new students, she said, was the highest on record, and all the entrants, with one exception, were aiming at the highest degree of all—that of the University of London. Possibly they would not all succeed in their ambition, but at any rate they would strive manfully, and those who failed would find themselves in the company of many other most excellent people. Another good omen was that for the second time the Fishmongers' Company had informed the school of its intention to award to one of the students a scholarship of £60 a year, tenable for three years. The formal address, which came from Mr. E. W. Roughton, one of the surgeons to the hospital, dealt with woman's sphere in medicine. It will be found in full in the early part of this issue On the conclusion of the address a vote of thanks, proposed by Dr. G. H. Savage, and seconded by Miss Aldrich Blake, M.D., M.S., Vice-Dean of the school, was passed, and the company then adjourned to the library, where tea was served.

CHARING CROSS.

THE Medical School of Charing Cross Hospital made a new departure this year, the prizes being distributed by a lady, Lady Juliet Duff, wife of the chairman of the hospital. She was introduced to the assembly by the chairman of the School Committee, and justified the wisdom of the authorities in asking her to undertake the task by a very pretty speech. Before the distribution took place Mr. WALLIS, the Dean of the school, gave a brief account of its progress during the past year. A money grant towards the school expenses had been obtained from the Board of Education, Mr. Stanley Boyd had taken up the chairmanship of the School Committee in place of Dr. Mott, and Dr. Eden had been elected to the post of Lecturer on Midwifery, made vacant by the resignation of Dr. Routh after eleven years' service. On the conclusion of the prize-giving the Huxley Lecture was delivered by Dr. Mott. It will be found in full at the beginning of this issue. The annual dinner took place the same evening at the Criterion Restaurant, where about a hundred past and present students assembled under the chairmanship of Mr. Peter Daniel, a former Llewellyn scholar of the school and now its Lecturer on Practical Surgery. In proposing the toast to "The Hospital and School," he mentioned that in establishing the school its founder had been partly influenced by the fact that in former days, when apprenticeship was in vogue, every student was faced by the risk of his principal dying before his articles had expired, and of his being unable to find someone else to take up these articles and thus make it possible for him to qualify without entering a fresh period of apprenticeship. Allusion was made, too, to the regretted illness of the school secretary, Mr. Pink, a universal favourite, who had been connected with the school before some of those present were born, and who had always proved a faithful servant. All hoped that his recovery would be speedy and complete. The toast of "The Visitors," proposed by Dr. Eden, was acknowledged by Professor William Osler, who said that despite the fact that the medical profession kept stamping out diseases, fresh ones made their appearance with each generation, so that, on the whole, the outlook for future members of the medical profession seemed quite fair. He regretted that an idea should have arisen among the public that there should be no intimate association between hospitals and medical schools, for the right place for senior students was not the school but the hospital. In no hospital in the country were patients better cared for, and better treated, and better looked after generally than in those which had medical students in their wards. Particularly absurd was the pretension that support should be specially withheld from hospitals having medical schools in which vivisection was carried on. Vivisection was absolutely essential to the furtherance of medical knowledge, and it was impossible to imagine any proper hospital in which the treatment used was entirely independent of discoveries due to vivisection. The toast of "The Chairman" having been proposed by Mr. Stanley Boyd and duly acknowleged, the formal proceedings ended with a vote of thanks to the honorary secretaries of the dinner, Drs. R. Cock and E. S. Calthrop.

KING'S COLLEGE HOSPITAL.

THIS year, as last year, the opening of term at the medical school of King's College Hospital was marked by nothing in the way of an address or other formal ceremony. The annual dinner of past and present students, however, duly took place, and once more the Waldorf Hotel in Aldwych was selected as the place of meeting. The company, which included Dr. Ferrier, Sir Watson Cheyne, Dr. Tirard, Dr. Urban Pritchard, and Dr. StClair Thomson, numbered about 106 persons, the chair being occupied by Dr. John Phillips, Obstetric Physician to the hospital, and Professor of Obstetric Medicine to King's College. The idea underlying this assembly of old King's students being that it should be a meeting of old friends rather than a

ceremonious gathering, the toast list only numbered two items, the "Health of the King," and "Success to the Medical School." The evening was distinguished from its predecessors by the opportunity being seized of presenting Dr. Urban Pritchard with a testimonial on his retirement from the staff after many years' service. During the course of the evening some excellent music was supplied by Dr. Harry Davis and by the Hospital Musical Society.

ST. GEORGE'S.

ST. GEORGE'S was the first of the medical schools to commence work, the inaugural proceedings taking place on Saturday, October 1st. They consisted of a prize-giving ceremony, at which Mr. Clinton Dent presided, followed by the annual meeting of the St. George's Club. The prizes were distributed by Dr. Squire Sprigge, an old student of the hospital, now Editor of the *Lancet*, who aptly completed his task by the delivery of an address on the subject of prizes; this appears in full in the early part of this issue. The annual old students' dinner followed on the same evening at Prince's Restaurant, Mr. G. R. Turner being in the chair. He took charge himself of the toast to "The Hospital and Medical School." It was acknowledged by Mr. A. William West, the Treasurer, on behalf of the hospital, and Dr. E. I. Spriggs, the Dean, on behalf of the medical school. The latter described the school as prosperous and as continuing to grow. A toast to "The Orator of the Day" was submitted by Mr. Brudenell Carter, Consulting Ophthalmic Surgeon to the hospital, and met with a suitable response from Dr. S. Squire Sprigge.

MIDDLESEX HOSPITAL.

FOR several years past the authorities of Middlesex Hospital have been conspicuous for their success in attracting to the ceremonies at the opening of the winter session popular personages of one kind and another. This year the company included two Field Marshals—Lord Grenfell and Viscount Kitchener—the Lord Mayor of the City of London, the Lady Mayoress, and the Sheriffs. The chair was taken by Lord Grenfell, the prizes distributed by Lord Kitchener, and the annual address delivered by Mr. Salmon Nowell, dental surgeon to the hospital.

The latter, in the course of his address, after giving an outline sketch of the history of medicine, and of the part played therein by sundry of its great men, said it would be observed that the profession of medicine was not only ancient and honourable, but throughout the ages had, broadly speaking, maintained a remarkable continuity of purpose in its aims, ambitions, methods, and work. The two former had been by studying Nature to discover the cause and origin of disease, and by putting such knowledge through the sieve of practical experience to render the tested residue available for preventive and curative treatment. Its method had been to observe intelligently and reflect on the phenomena of life in health and in disease, and to verify these by experience, experiment, and reasoned research. Its practical work or function, especially in the eyes of the public, had been, and still was, to prevent and eradicate disease, to heal the sick, and to relieve suffering. These seeds of purposeful energy had always borne good fruit. The men who each in his day, and usually in a quiet, unobtrusive way, had added to the total sum of medical knowledge, or upheld the dignity of the profession, or elevated it a notch or two up the social grade, had effected these things not merely by profound medical learning, but also by blending into their characters methods of work, habits of life, and certain high ideals which might aptly be termed "the professional attributes." To acquire and cling to these was the more desirable because professional work of any kind was prone to narrow the mind of those whom it occupied. In the case of medicine, those least exposed to the danger of narrowness of outlook were perhaps the busy, cultivated, general practitioners, who were at once the flower and the backbone of the profession. For these reasons every student should endeavour to cultivate the good habits which he already possessed, and gradually to assimilate such characteristics as might, and indeed must, from time to time favourably impress him in others. But perhaps the wisest habit of all was the habit of care in the formation of good habits, inasmuch as it was often harder to unlearn than to learn, while to uproot a bad habit was sometimes more painful and more difficult than to reduce a dislocation; moreover, it could not be done under an anaesthetic. In forming "methods of work" the student should not allow his thoughts to wander or worry over future difficulties, such as the examinations looming ahead. He should instead concentrate his attention on the day's work. If he was playing golf, then let the ball represent the day's work for him, and let him keep his eye on the ball; even then he might occasionally foozle a shot, but he would play a steadier game and would hole out on the green, or at Examination Hall, in a shorter time than otherwise and with less waste of energy. A factor in successful work was the interest taken in it, and the student who became interested in medical work was bound in natural sequence to become interested in human nature, and, consciously or unconsciously, to say with Terence, *Nihil humanum a me alienum puto*. In this spirit he would acquire the gentle art of gleaning knowledge from every one he met, whether lecturers, teachers, nurses, fellow students, or patients, until he could truly say, like Tennyson's Ulysses, "I am a part of all that I have met."

Lord Kitchener, when he had completed his task of distributing the prizes, delivered a short address, in the course of which he said he belonged to a service which was perhaps more closely connected than any other with the medical profession. It was the duty of soldiers not only to care for the health of their men in war time, but also in peace to work together with, and second the efforts of, their medical *confrères* in the treatment of disease, in the taking of precautions against epidemics, and in the prevention of disease in camps and barracks. To much of what had been accomplished in recent years towards improving the health conditions in the army he could himself bear witness. In India enteric fever was at last definitely yielding to improved sanitary methods and inoculation, and this disease, together with cholera, would, he anticipated, be before long entirely banished from barracks. A measure of the success which had attended medical work in India in the army was afforded by the fact that the ratio of "constantly sick, invalided, and deaths" to the whole strength of the army had been reduced during the last ten years by no less than 50 per cent. But efforts to reduce the dire effects of malaria had so far been baffled. The disease was endemic, and it was, unfortunately, impossible to adopt the measures suitable for dealing with it in a country where sanitation and water supply among the natives were not under the control of the authorities. Possibly it would fall to the lot of some of those present to work out some means which would prove both practical and effective in stamping out malaria without affecting the susceptibilities of the vast native population. He was sorry to think that England lagged behind other nations in the struggle for the prevention of disease, by means of improved treatment and improved sanitary methods. But this conclusion forced itself upon him when he saw what America had achieved, not only generally, but even in so apparently hopeless an area as the Isthmus of Panama.

The annual dinner, which took place the same evening at the Trocadero Restaurant, was by far the largest on record. It had as chairman Dr. Kellock, who, in proposing the toast to "The Middlesex Hospital and its Medical School," congratulated Mr. Andrew Clark on his appointment as Honorary Surgeon to the King. This was the first recognition His Majesty had made on the medical side of the Territorial Force, and it was one of a particularly welcome kind to Middlesex. The school itself was prospering as it had never prospered before, and, thanks to the large increase in the number of students, had become almost self-supporting. In the course of the

response made by him on behalf of the Weekly Board, Viscount Duncannon mentioned the notable fact that during the past year as many as 305 out of a total of 318 beds had been constantly occupied. During the course of the evening a telegram, wishing him a speedy recovery from his illness, was dispatched to Prince Francis of Teck, the chairman of the hospital, who has recently succeeded in clearing the institution of its debt of £20,000.

UNIVERSITY COLLEGE HOSPITAL.

The medical school carried on in connexion with University College Hospital opened its winter session nominally on Monday, the library of the new school buildings being the scene of a prize-giving ceremony. Previous to the distribution Mr. Raymond Johnson, the Dean, stated that in the past year there had been 284 students on the books of the school. He expressed, too, the general regret at the retirement of Sir Thomas Barlow, senior physician to the hospital and Holme Professor of Clinical Medicine. Only his colleagues, he said, could perhaps adequately appreciate the immense value his sound judgement and unfailing courtesy had been to the school, but many of those present were aware of his brilliant powers as a teacher and had benefited from them. Following the distribution of prizes an address was delivered by the Very Rev. the Dean of Salisbury, who pointed out that while the bridge between the present and the hereafter was Thought, the subjects on which medical students had to concentrate their minds were in some degree an impediment in the way alike of independent thought and of complete self-development. For this reason it was especially necessary that they should pursue mental culture and not allow themselves to be totally immersed in the sciences which formed the basis of medical knowledge. A useful prescription for them would be a bit of Wordsworth every day. It would teach them that the heart was more than muscle, and the eyes of a girl something more than a study in optics. The arts, too, might well engage some of their attention. Those who took his advice should not be afraid of having the word "dilettante" thrown at them. The word itself would not bite, and they could reply that dullness had always detested the versatile and brilliant. Was a little knowledge less desirable than complete ignorance, or was a dunce more admirable than a dilettante? He would like to see an eight hours bill introduced in all professions, and every professional man forced to retire at a certain age, in order that he might pay some homage at least to mental culture.

The annual dinner took place the same evening at the Gaiety Restaurant. Sir George Hare Philipson was in the chair, and the guests included the Dean of Salisbury, and the Provost and several professors of University College. In the course of his remarks in proposing the toast of "The School and Hospital," Sir George Philipson, now Professor of Medicine at Durham, mentioned that he joined the hospital as far back as the year 1855. In his day the teaching staff included such great men as Sharpey and Ellis, and he gave an interesting description of their ways and drew a contrast between the life of the medical student as it was and as it now is. The toast was acknowledged by the Dean of the medical school, Mr. Raymond Johnson, while that to "The Guests," which was moved by Dr. Herbert Spencer, met with a reply from Professor Sir William Ramsay. Before the company separated the health of the chairman, whose speech had been very much appreciated, was drunk, on the motion of Sir John Tweedy.

ST. THOMAS'S HOSPITAL.

The medical school of St. Thomas's Hospital was one of those which commenced the winter session without other ceremony than the holding of the annual students' dinner. This took place at the Hotel Cecil on Tuesday, under the chairmanship of Mr. Haslam of Birmingham, who, in proposing the toast to "The Hospital and School," said these appeared on the toast list together because in his mind, and in those probably of most of his audience, the two institutions were inseparably connected. Speaking of the practice of holding annual dinners, he said that he was himself experiencing one of its advantages, namely, the possibility it afforded to old students who lived far away of meeting numbers of old acquaintances and renewing old friendships. In responding to the toast, Mr. Wainwright, Treasurer of the hospital, compared the position of the hospital as it was in 1890, and as it is at the present day. In the interval, he said, five empty wards had been occupied, two children's wards had been added, and a debt of something like £40,000 had been cleared off. In addition, they now had a maternity ward, which had been opened that day, and in which students would have the opportunity of being thoroughly and efficiently taught the art of obstetrics. The only department which remained unchanged was that devoted to out-patient work. It remained much as it was when the hospital had been first built, while every other department had been reorganized, amplified, and improved. To make the out-patient department what it should be would be a very expensive undertaking, and nothing short of £40,000 would be of any service at all. The hospital had suffered in late years from lack of legacies; the establishment of the King's Fund had seriously affected this source of income, and would do so more in future. In former days people left money to certain hospitals in which they were more directly interested; now they were led to believe that by making a bequest to the King's Fund for distribution they were making better use of their money. But, alas! for reasons past the comprehension of any ordinary man, St. Thomas's Hospital and its special work and needs were absolutely ignored. The toast to "The Guests," proposed by Dr. T. D. Acland, was acknowledged by Mr. Butlin, President of the Royal College of Surgeons, who in the course of his reply mentioned that he was present for the first time in his life at an annual dinner other than that of his own school.

ST. MARY'S HOSPITAL.

The proceedings inaugural to the commencement of the work for the winter session at the school of St. Mary's Hospital took place on Monday under the chairmanship of the Senior Physician, Dr. Sidney Phillips. They included a prize distribution and the presentation of the annual report by the Dean, Sir John Broadbent, who observed that for the sixth year in succession a St. Mary's student had carried off a gold medal at one of the examinations of London University. The prizes were distributed by Sir Conan Doyle, who, after giving some account of his own medical career, which included a period of work as an unqualified assistant, said that the £1,000 which went to a medical man's education were not wasted even if he never practised. The work done by a medical student tinged the whole philosophy of life, and induced a healthy scepticism or desire to reason only from proven facts. It also taught a man to keep a confidence inviolate, to act promptly on a sudden call, to keep his head at a critical moment, and to be kind yet strong. Where outside medicine could he get such training? Moreover, a medical curriculum set such a high standard of strenuous work that to one who had completed it all other work came easy. On the other hand, it involved some dangers, one of them being intellectual priggishness, such as was represented by the young medical man who had all his diseases nicely tabulated, and all his remedies nicely tabulated so as to fit those diseases. But such weaknesses were set right by the post-graduate course known as life. This would teach him that there were agencies outside things which he could see, handle, and explain, and that a strong and kindly personality were as valuable an asset as actual learning. He would learn, too, that a reasoned optimism was essential to his success. It had been known from all time that the cheery man was the healing man, but now in unconscious hypnotic suggestion came the physical explanation of that fact. A medical man who could convey to his patients the expectation of cure served those patients well.

Another advantage of medical knowledge was that those possessed of it had a private lantern which threw a light of its own on their general reading. In every transaction of the world they were likely to discover some medical fact which influenced its origin. For instance, how came about such a custom as the wearing of wigs? A skin disease on the top of his head compelled Francis I of France to cover himself with artificial hair; his courtiers followed suit, and thus arose a custom which was absurd in itself and unknown to antiquity. But apart from such facts there was a wide field for the writer who would explore the influences of medical facts on social customs and historical incidents. Julius Caesar and Mohammed were both seemingly subject to epilepsy, and such conjunction of the highest human qualities with a humiliating disease had surely both its pathological and its moral interests. Medicine would probably also throw a sidelight on the history of Napoleon—possibly, too, on the inhuman actions of the movers in the French Revolution. They were a diseased company, a pathological museum.

The annual dinner took place the same evening at Prince's Restaurant, when Mr. Ernest Lane, the chairman, found himself faced by a company of 151 persons, which included as guests Sir Arthur Conan Doyle, Surgeon-General Gubbins, Sir Alfred Keogh, and many others. In proposing the toast of the evening, Mr. Lane mentioned the great loss both the hospital and the school had experienced through the death of Mr Henry Harben. In replying, Sir John Broadbent, the Dean, paid a tribute to the thankless and often unappreciated labours of the permanent staff; and this reference to Mr. Matthews, the honorary secretary, was very heartily endorsed by the company. He also dwelt on the unnecessary obstacles at present placed in the path of London students who desired to obtain a degree in medicine. They were seriously interfering with the prosperity of London schools, and in the interests of all concerned, including London University itself, should be removed. The formal proceedings ended with a toast to the chairman, proposed by Dr. Luff.

THE POLYCLINIC.

The Post-Graduate College and Polyclinic in Chenies Street, though its work is scarcely interrupted throughout the year, was one of those which marked the commencement of the winter session. It did so by arranging for the delivery of a special address by Dr. Robert Jones of Claybury. He chose as his subject the Teaching of Insanity to Medical Students and Practitioners in Relation to the Prevention of Mental Diseases, and as a kind of text took a passage in the latest, or sixty-fourth, annual report of the Commissioners in Lunacy. In this, after dwelling on the number of uncertified weak-minded women and girls to be found in workhouses, the Commissioners expressed the opinion that reluctance to certify such cases must arise largely from inexperience among local medical officers as to the requirements of certifiability. Dr. Robert Jones indicated that his own experience as a recognized teacher of London University in the subject of psychological medicine and as resident physician of one of the largest London asylums, supported the belief that the Commissioners were correct. In the course of his remarks he threw an interesting light on the genesis of the present legal status of lunatics and imbeciles. There were many people who still supposed that the insane population consisted solely of two classes—the ramping, raving lunatic, and the incurable drivelling idiot. In the recent past this was the universal belief. In the first class were included all cases in which brain development was arrested, with consequent arrest of the mental faculties; while under the latter were classed the cases in which the brain was born healthy but suffered later from some of the morbid processes capable of affecting it, either directly or indirectly, through the diseased states of the general system. In regard to the cause of insanity the corporeal character of the condition was generally admitted in the early history of medicine; it was looked upon as a disease primarily of the brain, and not as an immaterial disorder of the intellect. It was only with the growth of superstitious ignorance in the Middle Ages that the purely psychical origin of insanity arose. Curiously enough, the law in remote times also agreed with these two recognized divisions of insanity, for it classified all mentally-afflicted persons as of two types—that is, idiots and lunatics. The first appearance of the term "lunatic" in the Statute Book did not appear until the reign of Henry VIII, although under the Statute Book *De prerogativa regis* the King was to have rents and profits of an idiot's land to his own use during the life of the idiot, subject merely to an obligation to provide him with necessaries. In the words of the Act of Edward II, "the King shall have the custody of the lands of natural fools," and this custody was said to be permanent. In the case of the lunatic, on the other hand, the King was his trustee, holding the lands and tenements for his special benefit and that of his family. It was on account of this difference in the legal consequences of the two mental states that, on inquisition, two distinct writs were framed, one *De idiota inquirendo* for the idiot, and the other *De lunatico inquirendo* for the lunatic. Owing to the different results to the estates in the two findings juries avoided, whenever they could, a verdict of idiocy, because of this virtual confiscation to the Crown, and so the *De idiota inquirendo* fell into desuetude. This statute of *De prerogativa regis* was still an unrepealed Act, the care and custody of the insane still belonging to the Crown. Nowadays, however, the term "lunacy" had a wider connotation, as Dr. Samuel Johnson had probably foreseen would be the case when he said that madness frequently discovered itself merely by unnecessary deviation from the usual modes of the world. At the same time the Crown had also widened its prerogative by delegating the control of the insane to the Lord Chancellor, not as the head of the Court of Chancery, although many insane persons were its wards, but as the representative and delegate of the Sovereign. To-day, therefore, the jurisdiction of the Sovereign was exercised by the Lord Chancellor and also by such of the judges and lord justices as might be invested by the sign manual, by two Masters in Lunacy, and in certain clearly defined cases also by county court judges.

LITERARY NOTES.

The chief feature of interest in the August number of *L'Hygiène* is a long and extremely able article by Madame A.-Paul Juillerat on the work-girls, more particularly the seamstresses, of Paris. Madame Juillerat has evidently studied her subject closely at first hand, for she writes with the sympathy and insight of one who knows the difficulties against which these girls—wage earners from childhood—have to contend; and she paints their hard and narrow lives with the force and realism only possible in one who has actually been an eye-witness of its dreary monotony. Step by step, from the day when, as a child of 12 or 13, she takes her place in the workroom, Madame Juillerat follows the career of the "midinette," and without exaggeration or over-emphasis she shows us the dangers and hardships, both moral and physical, which beset the girl on all sides, and which are borne more often than not with infinite patience and courage. Whilst full of praise for the efforts made of late years to lighten the lot of these humble toilers, Madame Juillerat finds one great drawback to the whole system of woman labour—a drawback which appears at first sight to be inevitable, and yet which, if disregarded, will ultimately affect the community at large. Viewed in its proper light, it constitutes a grave national danger, and it is as such that Madame Juillerat denounces it in no measured terms. For it is surely a menace to the well-being of any race that its future wives and mothers should grow up totally unprepared for their primary duties in life; and Madame

Juillerat leaves no doubt that this is too frequently the case amongst the women of the working classes in Paris. She says:

> The great fault of the Parisian work-girl—[This remark she applies not only to the seamstresses, but to every type of woman worker]—is that she can do nothing at all outside her own particular occupation; and if, on the one hand, she who earns her living by her needle knows nothing of housekeeping, the factory girl, on the other hand, cannot even sew.

The French *ouvrière*, therefore, like her English sister in the same circumstances, marries in a state of utter ignorance as to the most elementary laws of domestic economy, and with the same result: a squalid, miserable home, neglected children, and a husband who is driven to drown his sorrow in alcohol. The manifold evils due to such ignorance are now being resolutely combated through the practical charity of a handful of ladies, who have realized that the only way of procuring a permanently better state of things for the future is by teaching the rising generation how to avoid the faults and mistakes of its predecessors. Through their efforts schools have been opened, where the potential "mères de famille" of the Paris slums, in the interval which elapses between their leaving school and going out to work, are being instructed in the different branches of housework—cooking, housekeeping, laundrywork, and the like, a step which should ensure an accomplished and efficient race of "ménagères" in the next generation. Madame Juillerat's interesting article is charmingly illustrated with photographs of the little scholars at their work in these schools of housewifery. Considerable space is also devoted to an interesting article by Professor Albert Calmette on the serious dangers incurred by the human race through the common brown rat, and the means which are being universally adopted all over the civilized portion of the globe to exterminate these bearers of disease. It is now a recognized fact that the brown rat not only carries the plague (a fact which, as Professor Calmette points out, has been remarked by historians from very early times), but is also capable of imparting trichinosis, tinea, and even hydrophobia. Mankind has at length realized the danger in which it stands, and a war to the knife has been declared against the whole race of rodents. Various methods of extermination have been adopted. Not only are the natural enemies of the rat—such as cats, terriers, ferrets, owls, etc., and such serpents as the boa constrictor and others who devour rats—enlisted on the side of man and encouraged in their work of destruction, but their victims are also destroyed in vast quantities by means of poisonous gases and the introduction amongst them of certain microbes. Another and very effective method is the payment of a certain sum for every rat killed in a certain district. Experience has proved that this poll-tax is almost as effectual as poison or germs in helping to rid the world of this deadly scourge. Where so much is excellent it is difficult to pick out anything for special praise, but mention must be made of M. Alexandre Derecq's "Hygiène et la beauté chez les impératrices de Byzance." These great ladies, it appears, owed the long duration of their charms as much to a strict attention to personal hygiene as to cosmetics. Another interesting article is one by Dr. Lucien Nass on "Les sports d'hier et d'aujourd'hui," in which the author traces the popularity of swimming as a means of exercise from Greek and Roman times down to the present day, and urges the advantages of a more universal proficiency in that useful accomplishment; whilst in "Hygiène et la vie" Dr. Maurice de Henry discusses the somewhat startling proposition brought forward by the late Dr. Jules Chéron, to the effect that one can get all the benefit popularly supposed to result from mountain air by the simple process of remaining quietly at home and receiving injections of a saline solution. *L'Hygiène* is, as usual, beautifully illustrated, both with photographs and reproductions of famous pictures. Not the least interesting amongst the latter is the head of Venus, from Botticelli's famous representation of the birth of the Goddess of Beauty.

The Edinburgh Pen and Pencil Club have, by permission of the owners, cut an inscription on the house in 23, Rutland Street, Edinburgh, occupied by the late Dr. John Brown. The inscription runs: "Dr. John Brown, author of 'Rab and His Friends,' lived in this house from 1850 to 1882."

SCIENCE NOTES.

IN the *Archives d'électricité médicale* of June 10th, 1910, Dr. T. Nogier of Lyons describes a somewhat paradoxical series of results which he has arrived at in an attempt to determine the effect of ultra-violet radiation upon plants. On submitting certain plants to two or three short daily irradiations from a Kromayer lamp, he found in every case the action of the lamp to be baneful. It had a manifestly inhibitory effect upon the floral organs, and made the plants appear dry and withered, although other plants of the same species, kept under identical conditions, save that they were not subjected to irradiation, retained their normal vigour. The most sensitive plant among those with which he experimented was the haricot and the next the geranium. The same investigator followed this up with some experiments upon plants and algae irrigated with irradiated water. He found that water which had been slowly circulated in the refrigerator of the Kromayer lamp possessed no deleterious influence upon the development of certain grass seeds, that adult geraniums were in no way injured, and that the vitality of the species of algae (*Cladophora*, *Spirogyra*) and of infusoria (*Colpoda*, *Paramecium*, *Volvox*) living in the irradiated water was not perceptibly lessened. In this connexion an interesting note was furnished by Professor R. W. Wood, of the Johns Hopkins University, in his Traill-Taylor lecture before the Royal Photographic Society (see *Photographic Journal*, October, 1910). He found that under ultra-violet light, using special quartz lenses, and blocking out all visible light with metallic silver, white flowers appeared black on the photographic plate. The power of white flowers to absorb ultra-violet light might, he thought, play some part in the plant's economy, but he was unable to discover any difference when, during the life of a white flower, he withheld its accustomed quota of ultra-violet from the light that reached it. But, possibly, if the procedure were carried out over some generations of the plant, the deprivation would induce some vital changes.

Following upon certain investigations which went to show that *x* rays, unlike ultra-violet rays, possessed no bactericidal action, Bordier and Horand, of Lyons, have turned their attention to the action of these two agents upon protozoa, as observed with the ultra-microscope.[1] They selected for experiment the amoeba and the flagellata, the former having a certain pendulous movement which it was easy to watch, and the latter—the *Xiphacantha alata* (*acantharia*)—having two flexible flagella, which, in the author's opinion, serve not only as organs of locomotion but also as organs of prehension. Living organisms of these two classes were submitted to the action of the *x* rays, the rays numbering 9 on the Benoist scale, and in quantity being sufficient to turn the barium-platino-cyanide pastille of the Bordier chromo-radiometer to Tint No. 2. Under this irradiation the movements of the protozoa went on as before. The experiment was repeated until the pastille turned to Tint 4—a very massive dose indeed—and still the rays were absolutely without effect. In the case of the ultra-violet rays the Kromayer lamp was employed. The amount of irradiation upon the culture in two separate experiments was respectively 18 and 12 units of quantity, according to the method recently expounded by Bordier[2] for quantitatively measuring the ultra-violet rays. After each experiment all movement, both of the amoeba and the flagellata, was at an end. The results, the authors point out, are identical with those obtained with the bacteria, and they propose to pursue the study, ascending the rungs of the zoological scale until they arrive at the first living thing to be deprived of life by the *x* rays. The difference in the effect of these agents upon the infinitely little is probably due to the fact that the ultra-violet rays have a chemical action, more particularly a reducing action, which, being exercised upon the protoplasm, brings about the destruction of the irradiated organisms. The *x* rays, on the other hand, produce chiefly the effects of ionization, which, doubtless, are only influential upon higher organisms than those with which the investigators have hitherto been dealing.

[1] *Archives d'electricité médicale*, September 10th, 1910.
[2] Ibid., May 10th, 1910.

British Medical Journal.

SATURDAY, OCTOBER 8TH, 1910.

WOMAN'S SPHERE IN MEDICINE.

THIS week has seen the commencement of another winter's work in the medical schools and the delivery of numerous introductory addresses. Several of them appear in full in the earlier pages of this issue, and extracts from others will be found in the section headed Opening of the Winter Session at the Medical Schools.

We confess to a considerable degree of sympathy with those on whom school authorities call on these occasions. It is not given to every one to treat such a subject as prizes with the same degree of felicitous originality as that with which it was handled by Dr. Squire Sprigge: and yet when introductory addresses are not merely of the hortatory order, a certain element of paradox almost inevitably attaches to them. They are addressed to young men whose knowledge of life is brief and of medicine *nil;* and these neophytes, in the very nature of things, are the persons least likely to appreciate the wisdom and experience which formal addresses commonly represent. Nor is much of what they have heard likely to remain even dormant in their brains to bear fruit at some future time, for on the day following the delivery of these addresses these young men plunge into a confusing sea of new work and new ideas.

Of the addresses delivered this year the most novel in point of subject is that in which Mr. Roughton, speaking at the London School of Medicine for Women, set himself the task of defining the sphere of women in medicine. It is one of those which appear in full in the early part of this issue. It will be found that Mr. Roughton did not include in his purview the admirable work done by women as nurses, and, not unnaturally perhaps, allowed himself to be led off into a consideration of what in essence and in etiology are the differences between men and women. With his illuminating and clear-sighted treatment of this question he coupled some brief allusions to the bearing of those differences on the suitability of women for the profession of medicine. Summed up, his net conclusion would seem to be that while the average man is at present more suited for medical work than the average woman, the time will come when this will no longer be the case, except, perhaps, in regard to the more harassing forms of private practice.

For the rest, beyond pointing to obstetrics and gynaecology as subjects with which all women should be conversant, he practically contented himself with mentioning the directions in which medical women have so far found most outlet for their energies—in appointments under county councils, in resident posts in hospitals for women and children; in sanatoriums, infirmaries, and asylums; in India, and, to a more limited extent, in private practice. In speaking of what women have already done, he did not, however, mention, as might have been expected, the invaluable services many of them have rendered as co-operators in the conduct of elaborate scientific investigations. The mental attributes which have contributed to this result possibly lie also at the root of another fact which has come under our notice—namely, that when given a definite task, which, although of a routine character, requires for its satisfactory performance both intelligence and strict attention to detail, medical women commonly make most excellent workers.

In respect of qualities which make for success in practice, Mr. Roughton, it may be noted, mentioned rapidity of perception as distinctly characteristic of the feminine sex. He pointed out, for instance, that it is not uncommon for a woman to be able to take in another woman's costume so accurately as to be able to describe it in detail even after a single glance. This is perfectly true, and even more striking instances of woman's rapidity of perception might be given.

On the other hand, rapidity of perception and the faculty of intuition which either results from or is closely allied to it, must certainly be included in the class of tertiary sexual characteristics, and these Mr. Roughton prophesied would disappear as time went on. If this prove the case—and it seems exceedingly likely—the advantage in question will vanish likewise. Indeed, in the case of intuition, which is presumably the outcome of the working of the subconscious mind, we have witnessed what appeared to be its progressive diminution in specific instances. In the young women in question, as the force of their ordinary mental processes became augmented by studies of a very advanced kind, their power of instantly reaching an unreasoned but accurate conclusion seemed to lessen, or, at all events, became less evident.

Another point of interest in Mr. Roughton's address is his belief that if things were as they should be, men would in no circumstances render medical assistance to women, and his assumption that everyone will certainly take the same view. The grounds for this belief not having been put forward, we can only consider them hypothetically.

If considerations of Propriety be one of them, they are a little unconvincing in an age when practically every subject on earth is discussed in the newspapers and novels which go the round of a family, and when there is literally no subject which is not at times quite frankly and openly discussed by persons of opposite sex, who, however well they know one another, meet not on a professional but merely social footing. Grounds of propriety, moreover, seem still further undermined when it is remembered that the whole tendency of modern life is to destroy the few remaining vestiges of the fences of custom and convention which, rightly or wrongly, our fathers erected between the sexes, and steadfastly maintained on every possible occasion.

If, on the other hand, the ground of the view is that women know more of women physically and mentally than men do, the argument will to many thinkers seem scarcely more convincing. The knowledge of physical life possessed by the average man is certainly greater than that of the average woman, whatever the nature of her education. Indeed, there are but two matters with which medical women may be acquainted and with which medical men are necessarily ignorant. One of them is what it feels like to become a mother, and with this subject most medical women remain as dependent on objective evidence as men.

The question of mental comprehension is more difficult. It takes a very clever woman to deceive her sister, but a very ordinary woman can easily deceive an average man. At the same time a capacity for seeing through a person instantaneously and unfailingly is not quite the same thing as comprehending him or her. Absolute comprehension of individual by individual, whatever the sex of the parties, probably never exists, but that degree of comprehension which consists in getting into touch with points of view and grasping motives and feelings with a certain amount of sympathy is often possible. Indeed, it commonly exists, even when women are concerned, in the case of those who, like most medical men, see much of the opposite sex, and in most circumstances of medical life is more useful than merely seeing through a person. It may be that as a guide to action mental skiagrams are none the worse for being a trifle blurred.

The fact that medical treatment has so far rested in the hands of men Mr. Roughton seems disposed to ascribe to custom and the persistence of tertiary sexual characteristics. This may be the case, but it does not seem to us fully to explain that preference for male medical attendants which certainly predominates among women. Part of this preference, at any rate, may be due to the fact that neither a purely male man nor a purely female woman is other than an exceptional being. The average man certainly contains in his composition something of those qualities which are commonly regarded as feminine, and these are very likely of assistance to him in dealing with women in a fashion which appeals to them. On the other hand, the converse condition in women may be a definite source of difficulty to them when dealing with their sisters. This converse condition is commonest in the higher types of women, and it is from the higher types of women that medical women are drawn.

The eventual outcome of the woman doctor movement still remains to be seen; meantime we are disposed to believe that the time at which the true sphere of women in medicine can be safely assessed has not yet arrived. But there is one thing which can already be said with assurance: they make not only very intelligent, but pleasant and admirably loyal colleagues. If the degree of *esprit de corps* habitually exhibited by medical women were universal among men, the difficulties of the medical profession in holding its own against organized bodies of the public and Government and municipal authorities would be infinitely lessened.

THE PHYSICO-CHEMICAL THEORY OF LIFE AND SPONTANEOUS GENERATION.

All natural sciences follow the same process of evolution. They begin by the observation and classification of natural objects and phenomena; this is the descriptive stage. They then attempt to resolve these phenomena, to determine the cause of their production, and thus they become analytical. When the mechanism of a phenomenon is understood it becomes possible, by the proper application of natural forces, to reproduce it; the science has then become synthetic. Biology has lagged behind the other sciences in its development, and has not yet advanced beyond the first two stages. The idea of biological synthesis is a bold one, and yet it is no novelty. It has cropped up in the imaginative literature of all ages, but, considered as a scientific possibility, its conception is of very recent date. Only forty years ago Traube of Breslau discovered the osmotic properties of certain chemical precipitates, and he was the first to construct an artificial cell. His work, however, was ignored. The same fate befell that of the Dutchman Harting. From that time until the beginning of the present century only a few isolated attempts were made at investigation along this line. Within the last few years, however, a number of works dealing with morphogeny have appeared, and several well-known names are now associated with the subject. Amongst these may be mentioned Quincke of Heidelberg, Benedikt of Vienna, Dubois of Lyon, Lehmann of Karlsruhe, and Leduc of Nantes.

The last named has just published the most recent book[1] on the matter, and he gives in it a summary and review of our present knowledge. Beginning with the consideration of some of the fundamental facts of physical chemistry, he proceeds to discuss the nature and properties of solutions, devoting special attention to the phenomena of diffusion and osmosis. Numerous instances are given of the morphogenetic power of the simple process of diffusion. By spreading a layer of salt solution on a glass plate, and placing in it several drops of a more concentrated solution coloured with ink, diffusion pictures of remarkable complexity may be obtained, depending for their structure on the arrangement of the drops. In such a way a highly complex cellular structure may be produced, consisting of a large number of hexagonal cells, each with a nucleus and cell-contents. If gelatine be added to the layer of salt solution, a permanent record can be obtained. Allied to this is the phenomenon of periodic precipitation. When the drops which are added to the layer of salt solution contain a substance which forms a precipitate with the salt, it is found that the precipitate is thrown down in concentric rings around the drop. In this way the addition of a number of drops regularly arranged gives rise to most elaborate precipitation figures. The process of karyokinesis can be simulated by a simple diffusion experiment. A layer of saline solution is spread on a plate, and this represents the cytoplasm. The nucleus is formed by a drop of the same solution, coloured with ink. The presence of the ink lowers the molecular concentration and the osmotic pressure of the drop. On each side of the nucleus is placed a drop of a more concentrated salt solution, slightly tinted. These form centres of attraction, and represent the centrosomes of an actual cell. The colouring matter in the nucleus thereupon begins to form a long, closely-rolled, spiral ribbon; this breaks up into long strands, which arrange themselves in the shape of the familiar mitotic spindle. The strands converge towards the centrosomes, and gradually the spindle divides into two along its equator, until finally the nucleus is completely divided, and in its place are two new nuclei represented by two darkly-coloured drops in the positions originally occupied by the centrosomes.

It is to osmosis, however, that Leduc attaches most importance as a morphogenetic force. It is, as he argues, the very motive power of all forms of life. Upon it essentially depend the vital processes of assimilation and nutrition. An animal or plant can live and grow only by virtue of osmosis. Not only is osmosis responsible for the maintenance and continuance of life, however, but it is also capable of creating living matter from its elementary con-

[1] *Théorie physico-chemique de la vie et générations spontanées.* By Stéphane Leduc. Paris: A. Poinat. 1910.

stituents; it is, in fact, practically equivalent to the vital force which we term life. Leduc does not commit himself to such a definite statement, but there can be little doubt that that is his tacit opinion, and his experiments and deductions give sufficient ground for such a belief. His argument is somewhat as follows:

The whole theory of evolution would be a dead-letter were the possibility of spontaneous generation, in some form or other, denied. Evolution admits of no break in continuity, and it is absolutely necessary to connect the simplest forms of living matter with inert matter. Lamarck recognized this and was the first to give it definite expression. Lamarck, Darwin, Haeckel, and many others have investigated the laws of evolution, and have shown, amongst other things, that natural selection acts upon variations, but they have not sought to probe the question of how those variations have arisen, how they have been produced. This is evidently a matter the explanation of which must be sought for amongst the most elementary of vital processes. In osmosis we have a fundamental physico-chemical force capable of elaborating not only simple shapes, but also shapes resembling highly organized animals and plants. The morphogenetic power of osmosis is best illustrated by some simple examples. When a substance soluble in a concentrated solution is placed in a liquid with which it forms a colloidal precipitate, it becomes surrounded by a thin layer of this precipitate, which forms an osmotic membrane. Water penetrates this membrane from without, and, being retained, causes it to distend. In this way an artificial cell is produced, the original substance being, as it were, the nucleus and the osmotic membrane the cell wall. Such a cell can be produced by placing a fragment of calcium chloride in a concentrated solution of potassium carbonate. The osmotic membrane in this case is composed of calcium carbonate. The cell may grow to a large size, but more frequently it gives rise to another cell and yet another, until a perfect tissue is formed. A great variety of other substances and solutions may be used in the same way, each giving rise to a characteristic formation. Thus, by dropping a pellet composed of copper sulphate and sugar into water containing sodium chloride, potassium ferrocyanide, and gelatine at 35° C., a highly complex, plant-like form will be evolved, consisting of roots, branches, and leaves. Corals, seaweeds, mushrooms, shells, etc., can all be formed by a similar procedure. The resemblance to living beings does not end at outward appearance, for the internal contents of these structures consist of a viscid fluid displaying movements like those of protoplasm. Further, when the osmotic membrane is ruptured this fluid escaping forms a coagulum which closes the wound just like a blood clot. There are other analogies between these osmotic productions and living beings, and the only essential difference would appear to be that they do not consist of protoplasm, and are therefore not living matter as we understand it.

Leduc's experiments are elementary and even crude, but it cannot be gainsaid that were the proper substances and solutions to be discovered, osmotic structures consisting of actual living protoplasm might be created. Such substances must have been present at the first appearance of life on earth. When the earth was cooling it was the seat of constant electrical discharges, most powerful synthetic agents, which caused the atmospheric nitrogen to enter into combination with other elements to form nitrogenous bodies, and eventually with carbonic acid to form albuminoid material. The elaboration of this into living matter thereupon took place through the agency of osmosis. Apart from this speculation Leduc advances many ideas that might be followed up with interest and advantage, and if he has not succeeded in creating life he has at least indicated a possible scientific explanation of its origin.

THE ASYLUM WORK OF THE LONDON COUNTY COUNCIL.

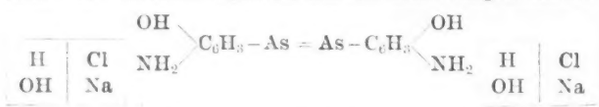
The twenty-first annual report of the Asylums Committee of the London County Council, which has just made its appearance, brings the history of the ten asylums under the jurisdiction of the Council up to the end of March this year. The appendices number eight, and include reports from each of the medical superintendents, and from the Director of the Pathological Laboratory, Dr. Mott. One of them is made up of about one hundred pages of statistical tables, which are drawn up in the form prescribed by the Medico-Psychological Association, and show in the fullest detail the nature of the cases with which the medical officers of the Board have had to deal. They are preceded by a useful memorandum in which the clerk of the committee, Mr. H. F. Keene, analyses the statistical tables in their turn, and brings out the salient features of the figures for 1909–10 as compared with corresponding data in earlier years. The diminution in the progressive rate of the call on the accommodation provided by the Council, which has been noted during the past few years, seems to be continuing, the average annual increase in the accommodation in the past twenty years being 490, while in the present year the increase has only been 198. The proportion of male to female patients is greater than it was twenty years ago, thanks apparently to the fact that the death-rate, which has decreased for both sexes, has decreased considerably more among the males than the females. The female population, however, still considerably outnumbers the male population, the percentage of males being 43 and of females 57. The plans for the two additional villas at the epileptic colony have been approved, and the work is expected to be carried out during the present year. Regret is expressed that the committee has not yet been able to secure a suitable site for the proposed mental hospital, towards which Dr. Henry Maudsley promised to contribute a sum of £30,000. It is stated that many sites have been considered, and that one site which the committee believed it had secured was withdrawn by the vendors at the last moment, and after the Council had voted the necessary purchase money. Considerable space is devoted to dealing with an allegation which was made against the committee by one of the London boards of guardians last year. It was to the effect that the fashion in which the committee operated its system of admitting private patients was detrimental to the interests of ratepayers. It is shown that, so far from this being the case, the committee's practice is a source of relief to the rates. It is also indicated that the probable effect of the introduction of the Asylum Officers' Superannuation Act last year will be a financial saving, inasmuch as the scale which it lays down is less liberal than that hitherto in vogue in the asylums of the Council.

EHRLICH-HATA'S REMEDY.

There seems to be an impression in this country that the remedy known as "606" is a chemical mystery. This idea probably owes its origin to the fact that

Ehrlich has refused to allow it to be offered for sale until its therapeutic value has been thoroughly studied by competent authorities in large clinics, where the number of syphilitic patients renders investigation easy. In order to dispel the error, we append the chemical formula of the substance. Dioxy-diamido-arseno-benzol has the following chemical constitution:

The chloride of this substance is put up in sealed tubes, and before injection the sodium salt is prepared by the addition of sodium hydrate before solution, so that the material injected has the following formula:



Wechselmann[1] has now treated over 900 cases with this preparation. He has a few important observations to record. In the first place, the death of two infants who received 0.03 gram for syphilitic pemphigus having been attributed to a sudden setting free of the products of the spirochaetes, caused him to diminish the dose for infants affected with hereditary syphilis. Giving 0.015 to 0.02 gram and repeating the dose after from eight to twelve days, he succeeded in removing all the symptoms without producing toxic signs. Since the Wassermann reaction in one of these cases persisted, he gave a third injection, which converted this into a negative reaction. Next he reports that, although a certain number of patients improved with one injection of 0.3 or even 0.25 gram, some of the signs did not clear up. He therefore repeated the dose, giving 0 4 or 0.5 gram this time, with satisfactory results. He gives some details of these cases. In critically surveying his results, he comes to the conclusion that the number of patients who have proved resistant to the treatment is very small, and that he has only been compelled to give a second injection in a very few cases. Recurrence of symptoms after injection is much less common than after treatment with mercury. His cases show that there is but little danger of hypersensibility to the drug or of the spirochaetes becoming refractory to it, like they do to atoxyl and other drugs. It therefore appears that the best dose for males is 0.5 to 0 6 gram and for females 0.45 gram, and that when required this dose can be repeated without danger and with advantage. He considers that the second dose should be given not less than three or four weeks after the first. Emil v. Gròsz[2] points out that Ehrlich has warned the clinician not to give "606" unless the eye has been found to be absolutely intact. While he agrees that the drug is contraindicated in cases of simple atrophy of the optic nerve, he has come to the conclusion that it is eminently suited for cases of syphilitic affections of the eye. He has used it in 14 cases of ophthalmic conditions, including a conjunctival chancre, syphilitic iritis, syphilitic keratitis, syphilitic scleritis, syphilitic chorio-retinitis, and parenchymatous keratitis arising in congenital syphilis. The result was excellent in all these cases. Kromayer,[3] who has employed it in 250 cases, advises a dose of not exceeding 0 5 gram and not more than 0.9 gram total quantity to any one patient. He gives the larger dose at the first injection, and follows this up with doses of 0.1 or 0 2 gram if necessary. He has not met with any signs of a toxic effect of the remedy by his method of fractionated doses.

[1] *Deut. med. Woch.*, September 15th, 1910.
[2] Ibid., September 15th, 1910.
[3] *Berl. klin. Woch.*, September 26th,

WELSH MEDICAL DINNER.

THE annual Welsh medical dinner was held on September 30th in London, under the presidency of Mr. Robert Jones, of Liverpool. Among those present were Sir William Allchin, Mr. Butlin (President of the Royal College of Surgeons of England), Dr. Lloyd Owen, Birmingham; Mr. Lynn Thomas, Cardiff; Dr. Owen Pritchard, Gloucester Square; Fleet Surgeon Lloyd Thomas; Dr. Richard Williams, Bangor; Dr. Williams, Llanberis; Dr. J. Williamson Pugh, Brighton; Dr. J. T. James, Harley Street; Dr. S. Cromwell Jones, Merthyr; Dr. D. J. Thomas, Acton; and Drs. D. L. Thomas, Stepney, and J. Howell Evans, Berkeley Square, the honorary secretaries. After the loyal toasts the President proposed that of "Meddygion Cymreig a Meddygion Cymru" (Welsh doctors and doctors in Wales). There was always, he observed, about the Welsh medical dinner an atmosphere of irresponsible joviality which was the outcome of close kinship. It was only the few unfortunates who were expected to say a few words who felt the burden of life heavy on these occasions. Referring to his eminent predecessors in the chair, the President mentioned Sir John Williams, who, after an illustrious professional career, was devoting himself with renewed youth to the formation of a great national library; Sir Richard Douglas-Powell, one of the most distinguished physicians of the day; Mr. Edmund Owen, the renowned surgeon; Dr. Frederick Roberts, the genial author of a monumental work on medicine; Sir Isambard Owen, whose work and patriotism were national assets; and Dr. Lloyd Owen, who spread the gospel of surgery in far-off Jerusalem. He was glad to announce that they had been able to found the Welsh Medical Club, which would help to cement the Welsh medical fraternity in the bonds of brotherhood. The toast was cordially honoured, and was responded to on behalf of the profession by Fleet Surgeon Lloyd Thomas. Dr. Horron Thomas, of Leicester, proposed the toast of "The Visitors," to which Sir William Allchin and Mr. Butlin responded, and the health of the President was musically honoured on the proposal of Mr. Lynn Thomas.

THE HIGHER CLEANLINESS.

IT is a mere truism to state that the domestic and the surgical conceptions of cleanliness are leagues asunder. Yet, little by little, the higher ideal which we owe to the researches of Pasteur and Lister may confidently be expected to permeate society, reacting in innumerable ways upon the habits of gentle and simple, until a time may come when our descendants may look back upon us with something of the incredulity, not to say horror, provoked in us by the records of unwashed mediaevalism. To the man of that halcyon age the vision of a twentieth century youngster picking an apple from the ground and eating it, skin and all, after a preliminary polish with the palm of a grubby hand, will appear typical of our primitive disregard of matters hygienic. In those days all barbers will sterilize their implements as a matter of course. The humble necessary loaf, exempt from the contamination of promiscuous handling, will no longer be carried in dirty baskets, taking its chance of a roll in the mud or of contact with an errand boy's jacket of uncertain age but undeniable griminess. Nor will it, in the absence of the housewife or servant, be deposited in its unprotected state upon dusty window sill or filthy doormat. Freshly cooled from the cleansing oven, it will be enclosed in a sealed paper bag, and lovers of crust will partake thereof without dread of enteric or diphtheria. To eat strawberries bought in the public mart without precautions against infection will be regarded as the act of a lunatic.

Incredible, without doubt, will appear the complaint of Dr. W. H. Symons in a recent number of the *Medical Officer* to the effect that the men employed by the Bath Tramway Company, before attaching labels to parcels, are in the habit of moistening the gum by spitting upon it. After all, it is hardly fair to ask the men to lick the labels; we hope, therefore, that the company will act upon the advice of Dr. Symons and provide proper dampers. There is much, too, to be said for his further suggestion that, by way of checking the dangerous practice of licking postage stamps, the gum used might with advantage be mixed with some pungent substance, such as cayenne pepper or aloes. The Postmaster-General has for some years provided stamp dampers in all the principal post-offices. But it is one thing to take a horse to the water and another to make him drink.

MEDICAL TERMS IN THE "NEW ENGLISH DICTIONARY."

This quarterly part[1] of the great dictionary is edited by Sir James Murray himself, and covers, roughly speaking, the *ta's;* it is also the first portion of the ninth volume of the whole work. Here together, within the same boards, we find words old and new of the English language, the old Greek word *taxis* rubbing shoulders with *taxi-cab*, babe of yesterday, the latter showing its neonatal character by holding on to its hyphened state. But it is with medical terms alone that we are here concerned. To begin with *taxis*, it is perhaps worth while to emphasize its definition—"a manipulative operation employed for replacing parts which have quitted their natural situation, for replacing hernia, etc."—for there is reason to believe that the manipulation is not always free from force, although force is not in any way indicated either by the definition or by the etymology (Gr. τάξις, arrangement). *Taxis* should be no more than a methodical pressure by means of the hand. *Tay or tey* is a curious obsolete medical word, meaning "a web or cataract in the eye," or "the outer membrane of the brain" (cf. Fr. *teie dure*, dura mater), and it comes from the Latin *theca* and the Greek θήκη, a sheath or covering. Lowe, in his *Chirurgerie* (1597), has the interesting phrase, "Some cataract or taye which covereth the prunall called the windowe of the eye." In turning over the pages of the *Dictionary* one is struck by the labyrinth of words with different meanings and etymological relationships which surround the term *tartar:* there is *Tartar*, the inhabitant of Tartary, with all its curious shades of meaning—vagabond, military valet, savage, and a kind of cloth; there is also *tartar*, the infernal regions, from Tartarus, with its little family of words, *tartarean*, *tartarize*, and *tartarology;* there is the medical or chemical *tartar*, perhaps of Arabic origin, so common in such "phrasal combinations" as *cream of tartar*, *salt of tartar*, *spirit of tartar;* and lastly, there is Daudet's bombastic character-creation *Tartarin of Tarascon*, with all his present-day boastful and loquacious progeny and successors. The reader may easily and entertainingly spend half an hour in a ramble among these *tartarean* words. *Tarsus* is given as an incompletely naturalized word; but many of its derivatives, such as *tarsal*, *tarsectomy*, *tarso-metatarsal*, and the like, have been admitted to full membership in the language, so to say; the Greek ταρσός means the flat of the foot between the toes and the heel, and also the rim of the eyelid, explaining the double signification of the adjective *tarsal*. Another interesting term is *tarantism*, concerning which Sir James Murray has several things to say. Its etymology is involved; it is derived from *Taranto* (Tarentum), the Italian town, but is popularly associated with *tarantola*, the tarantula spider, which, in its turn, may also be connected with the town. It is defined as "a hysterical malady, characterized by an extreme impulse to dance, which prevailed as an epidemic in Apulia"—lately the scene of the outbreak of the more fatal malady, cholera—"and adjacent parts of Italy from the fifteenth to the seventeenth century, popularly attributed to the bite or sting of the tarantula." The Editor adds the somewhat disturbing note that "the dancing was sometimes held to be a symptom or consequence of the malady, sometimes practised as a sovereign cure for it," leaving us to conclude that rational therapeutics are hardly to be found in this direction. But "music hath charms," and Cowley, in his poem *Davideis*, writes: "And true it was, soft Musick did appease Th' obscure fantastick Rage of Saul's Disease," and places in a footnote this further: "If it were not for this Example of David, we should hardly be convinced of this Physick, unless it be in the particular cure of the tarantism, the experiments of which are too notorious to be deny'd or eluded, and afford a probable argument that other diseases might naturally be expelled so too, but that we have either lost, or not found out yet that art." In this connexion, although it has no immediate bearing upon the *New English Dictionary*, the curious reader may turn to Professor La Torre's book, published this year, entitled *La Musica al Tribunale d'Igea*, for much that is concerned with the curative effects of music. Among the many other medical terms dealt with by Sir James Murray in this instalment of his great undertaking may be named (there is no space for more than a naming) *tabacosis*, *tabefaction*, *tabefy*, *tabella*, *tabes*, *tabescent*, *tabid*, *tablet* (in its pharmaceutic meaning at any rate), *tabloid* (a word with as strange and eventful a history as the far-famed and comfortable word Mesopotamia), *tacamahac* (an aromatic resin), *tache*, *tachycardia*, *tachythanatous* (killing quickly), *take* (in its medical meanings), *Taliacotian operation* (the plastic procedure devised by Tagliacozzi, the Bolognese surgeon), *talipes* (literally, ankle-foot), *tamarind* and *tamarisk*, *tampon* (a doublet of tampion), *tangle-tent*, *tannin* and the *tanno's*, *tapetum*, *tapotement*, *taraxacum* (with its interesting etymology), and *tar-water* ("formerly in repute as a medicine").

[1] *A New English Dictionary on Historical Principles.* Edited by Sir James A. H. Murray. T—Tealt. (Vol. ix.) Oxford: At the Clarendon Press, etc. Double section, price 5s. October 1st, 1910.

A NEW TUBERCULIN.

In the course of experiments undertaken for another purpose, F. J. Rosenbach found that trichophytes (*Trichophyton holosericum album*) grew freely on cultures of tubercle bacillus, and after a time, during which they not only formed a mycelium at the point of oculation but also permeated the whole culture, the bacilli showed certain marked changes. They take on a darker staining than usual and reveal other signs of undergoing involution.[1] Rosenbach believes that the culture of the tubercle bacillus is altered owing to the trichophytes destroying the toxic labile portion of the tubercle product, while the immunizing stable portion, which forms antitoxin, is unaltered. It may here be stated parenthetically that he does not adduce any evidence of the existence of these two fractions, nor indeed that any antitoxin formation can take place at all. After reciting the manner of preparation of the new tuberculin from this mixed culture, he proceeds to compare its action with that of other tuberculins. Normal guinea-pigs tolerated the new tuberculin in "very large" doses. The only quantita-

[1] *Deut. med. Woch.*, August 18th, 1910.

tive datum given is that 2.5 c.cm. per kilo body weight does not kill. Guinea-pigs which had been inoculated with tubercle bacilli (Rosenbach says with "tuberculin," but this is probably a slip of the pen) reacted fourteen days later to an injection of 0 5 c cm., but the reaction disappeared rapidly and did not reappear when the injections were repeated. On *post-mortem* examination, after periods varying from twenty-six to fifty weeks, they showed encapsuled tuberculous lesions of considerable extent. Non-tuberculous human beings tolerated the tuberculin in large doses without disturbance of health. He applied the tuberculin to tuberculous persons both by injection subcutaneously at some distance from the seat of disease, and also locally into the lesion. He states that his observations with the latter method require further time before deductions can be drawn. He claims that his tuberculin exercises an elective action when applied subcutaneously for phthisis and surgical tuberculosis. First a leucocytic inflammation takes place locally with the formation of an exudation, then absorption sets in and cure results, provided that caseous or granulating degeneration is not present. The same process, only more intense, was seen in lupus and surgical tuberculosis when the tuberculin was injected locally. He gives details of cases, from which it appears that the curative process takes place slowly after the injection of from 0.2 to 0.9 c cm. of the tuberculin. He claims that the results obtained are very remarkable, but neither in the 3 cases quoted in which the tuberculin was applied locally nor in the 12 cases in which it was injected subcutaneously do the records reveal the "very remarkable" curative process. He concludes by stating that where no caseation, tuberculous granulations, or suppurative processes exist, a number of injections is capable of restoring tuberculous joints, tendons, etc , to a normal condition. Early lupus can also be cured almost completely, and the remains which resist cicatrization can be removed surgically. Caseating foci discharge their pus, and after casting off the unabsorbable products heal up by contraction.

CONGRESS OF OBSTETRICS AND GYNAECOLOGY.

THE fifth International Congress was held at St. Petersburg from September 22nd to the 28th. The Congress was well attended by members and delegates from many nations; some exception was shown by the few from France and Austria, in which countries meetings of a similar kind detained those who otherwise might have been present. The order of the business was admirably arranged, with a completeness and precision which left little to be desired, either in the scientific and technical work of the Congress or in the fullness of the social functions which supplemented the visit of those participating in the occasion. The following British delegates were present: Dr. Amand Routh, representing the Royal College of Physicians, the Royal College of Surgeons of England, and the Obstetrical Section of the Royal Society of Medicine; Dr. Jervoise Aarons (London) and Dr. Thomas Wilson (Birmingham), representing the Royal Society of Medicine; Sir Alexander Simpson, representing the University of Edinburgh; Professor Edward Malins, representing the University of Birmingham; and Dr. McElligott (Wigan), representing the Royal College of Surgeons of Ireland. Besides the literary and scientific duties of the Congress, full opportunities were given for visiting the various hospitals and clinics, which are numerous, well equipped, and ably conducted. The administration maintains 15 refuges (homes or hospitals) for childbirth, numbering 347 beds, in which during the year 1909 there were 19,347 patients admitted and relieved. In many of these institutions private patients can enter on payment of arranged amounts. A payment of 15 roubles includes the whole attendance during a stay of ten days, or smaller sums are charged according to the circumstances of the patient. Thus it comes about that nearly 42 per cent. of all the confinements in St. Petersburg take place in the municipal maternities. The advantage of this cannot be overestimated, since all means are given for the safety of the patients—the best medical skill, careful nursing strictest aseptic arrangements, all combined with attention to the convenience and comfort of the recipients. One place demands special admiration—the Institute of Gynaecology and Obstetrics. It is a large and elaborate building, founded in 1898 and removed to the present site in 1907 under the auspices and patronage of the highest in the land. It consists of 130 rooms, of which 66 are given to patients, the others being large operating rooms, rooms for various kinds of treatment, officers, and staff. In some of these it is possible to disinfect with a current of steam under high pressure before the place is used. The opportunities for physical treatment are very perfect, such as all kinds of electricity, light of sundry kinds, baths of many diverse methods, and massage arrangements—indeed, every appliance and apparatus calculated to combat disease and facilitate recovery. But beyond the many and interesting opportunities of witnessing the most advanced methods of treatment the members of the Congress were received with the utmost courtesy and consideration by their medical brethren and the Russian authorities. Public places of great interest were made easily accessible; Royal palaces were thrown open to their inspection; museums and galleries were ready for visiting, without restriction. A spectacle gala at the opera-house, opportunities of hearing the most delightful music in the best churches, all tended to supplement the pursuit of knowledge combined with the finest aesthetic tastes.

HOSPITALS AND THE HEALING ART.

A NEW cottage hospital was opened at Bangor, co. Down, on October 1st, Lady Clanmorris, President of the Hospital Committee and the giver of the site and the grounds, being in the chair. The building is in the early Georgian style with red brick walls and sandstone trimmings. In the planning of the various wards especial care has been taken to ensure ample light and air. Access to the hospital, which has a frontage of 130 ft., is gained through a spacious entrance hall situated in the centre of the block, from which corridors extend right and left to the medical and surgical wards, eight in all. An operating-room, with dressing-rooms attached, is centrally placed and lighted by large plate-glass windows. Behind the main block are arranged the kitchen, offices, and laundry; the matron's room, adjoining central fireproof staircase and front entrance. Ample accommodation for the nursing staff is provided on the first floor, with dining room on ground floor. Lady Clanmorris said it was now many years since the first cottage hospital in Ireland was started there by her mother, who had sympathetic interest in all that concerned the well-being of Bangor. Sir John Byers, after congratulating the people of Bangor on their new hospital and on their progressive spirit, went on to speak of the necessity and usefulness of hospitals. He said the earliest Christian examples of hospitals were those of the Knights Templars and Knights of St. John in Jerusalem and other places in Palestine at the time of the Crusades

while of those hospitals other than Christian probably about the first of such institutions for disease were those founded by Buddhist priests in India. Hospitals had, by saving life, not only reduced the death-rate, but they had also added to the duration of human existence; without hospitals the healing art would come to a standstill, and there would be no trained medical men in the future. But apart from its special function, a hospital taught people residing in it the value of discipline, it showed the practical carrying out of the gospel of cleanliness, and so it came to have an indirect effect in making those who for a time were within its walls put in force when they went home some of the lessons they had learnt. Finally, an institution like theirs increased the experience and improved the skill of the medical men connected with it—factors which were of advantage to the whole community. Sir John reminded his hearers that Bangor in ages past was a great seat of learning, to which people came from all parts to be taught—it was believed that Alfred, King of Northumbria, had been educated there—and from which Irish missionaries carried knowledge all over the world. The remains of the primitive glory of Bangor—as a great place of education founded in the sixth century by Comgall, who was born at Magheramorne—were now slight, but fortunately one monument had survived the injury of time in the form of a manuscript Antiphonary, or book of anthems, compiled expressly for the use of that community, and written about twelve centuries ago. It was believed by some that this famous work was taken to Bobio, in the Appenines, by Columbanus, an Irishman of distinction, who received his education under Comgall, and who afterwards founded a monastery at Bobio, or it may have been that the book was taken out there by some of his followers or disciples. In the seventeenth century it was removed to the well-known Ambrosian Library in Milan, where it now remained. It contained hymns, prayers, anthems, etc. In early ages, in such seats of learning as existed at Armagh, Bangor, and Downpatrick, some of the teachers had also the only knowledge of medical science which existed in these early times, and Sir John Byers stated that some years ago, while making a research into the existence in former years of leper hospitals in Ireland, he found that there had been such institutions in Armagh, Carrickfergus, Kilclief near Downpatrick, and many other places, and his venerated friend, Bishop Reeves—the most accurate of Irish ecclesiastical antiquarians—had told him that he had evidence of there having been a leper hospital long ago at Bangor. Columbanus and others had gone out from Bangor as missionaries in early days, and in their own day they had the Dowager Marchioness of Dufferin, who had also gone from Bangor to do so much in establishing hospitals in India. In conclusion, while they had not in that town such a great educational centre in their midst as formerly, he congratulated them on the fact that they had now in Bangor a good technical institute and a most efficient modern cottage hospital.

IODINE DISINFECTION OF THE SKIN.

ONE of the most serious problems in aseptic surgery is that of removing all sources of wound infection from the hands of the operator and from the skin of the patient. There is strong reason to believe that perfect disinfection of the hands is a practical impossibility. But the surgeon does not aim at theoretical results obtained in the bacteriological laboratory; he merely insists on primary intention healing of wounds in 100 per cent. of his cases. Many surgeons no doubt obtain in clean operations such a result in a variety of ways; but in those cases in which this result is not obtainable, all that is required is that the operator should wear sterile gloves. Since, therefore, the question of the safeguarding of the patient from infection from the hands of the operator is practically solved, the surgeon need not look anxiously to the experimenter for new methods, but should be content to use those which yield good results until a theoretically perfect method has been worked out. The danger of wound infection from the skin is not settled so easily, for in many cases the patient, after a machinery accident, or with an infective process affecting the skin, has to subject himself to a surgical procedure, and a satisfactory method of disinfecting his skin then becomes imperative. The perchloride of mercury with or without alcohol, ether and alcohol, and various other processes, fail to ensure healing by first intention in soiled areas of skin. For such a condition some special method is required, and it is interesting to note that no less an authority than Professor F. König of Altona has given the method of disinfection by iodine evolved by Grossrich a trial with excellent results. Dr. W. Müller reports this experience.[1] The method has been applied not only in cases of infected skin, but in all kinds of cases, since disinfection by the older methods takes a long time, is disagreeable or even painful to the patient, and has other disadvantages. Grossrich's method is as follows: On the day before the operation, provided there is no urgency, the patient is bathed and shaved. As soon as the patient is brought into the operating theatre on the following day, the area of skin involved is energetically painted with a 10 per cent. tincture of iodine. About fifteen minutes later, when the patient is asleep, a second painting is performed. Five minutes later the operation begins. After the skin has been sutured, the incision is again painted before the dressings are applied. When there is urgency the skin is shaved dry. This is important, as the action of the iodine is impaired if the skin is moist. In certain cases it may be wise to paint before shaving, so that no infected hairs may fall on a contused or open wound. If great urgency exists, the time between the painting and the commencement of the operation may be shortened. By using iodine disinfection, linear scars, we are told, can be obtained even in operations which affect areas of skin badly soiled by dirt. Müller claims that the iodine method can be carried out without difficulty in any place, in a few seconds, that it becomes active in a few minutes, that it can be applied successfully in all kinds of wounds, that it is absolutely certain—we should feel more confidence in the method if he had not claimed infallibility—and that it is so simple that an untrained attendant can carry it out. Being an army medical officer, he pleads for its application on the field of battle. Whether this account be exaggerated or not, this method seems to deserve an extensive trial in infected accident and other cases in which the present day procedures are admittedly insufficient.

YELLOW FEVER IN WEST AFRICA.

ON October 3rd Sir Rubert Boyce, who recently returned from West Africa, gave an address to members of the African Trades Section of the Liverpool Chamber of Commerce on yellow fever in West Africa. He said they would soon be in possession of facts that would throw new light on the diseases of the West African Coast, and as the result they would probably before long be taking radical steps to suppress one of the chief causes of mortality on

[1] *Deut. med. Woch.*, August 25th, 1910.

that coast. He had come to the conclusion that yellow fever was endemic in West Africa, and that for years it had been mistaken for malaria. Many men must have died on the coast from yellow fever, whose deaths had been attributed to malaria. Yellow fever had never been absent from Sierra Leone since 1806, and it was described by natives as "the disease of the newcomers." He went on to say that the mortality returns in Sierra Leone had greatly improved. One cause of this was that now people used mosquito nets and exercised greater care in living generally. *Stegomyia canopius* was the cause of all the trouble. Although it had been said that this mosquito was most difficult to tackle, as a matter of fact it was the easiest to get rid of. If they kept on attacking it, not only would they never hear anything more of yellow fever, but the death-rate on the coast would go down with a run, and many other diseases would disappear also. It was not expensive drainage that was required. Getting rid of the disease would be comparatively easy if they all co-operated, and did not leave the matter entirely to be dealt with by the Government.

A LOURDES "CURE."

IN the *Tablet* of October 1st there is a letter signed Francis Izard, O.S.B., of St. Thomas's Abbey, Erdington, Birmingham, which we publish in full as it points a moral which has often been enforced in this JOURNAL. The writer says: "Some months ago, in response to a letter in the *Tablet* for funds to enable a necessitous patient to go to Lourdes, I received generous alms from several people. Accompanied by a nurse, the patient was at Lourdes for ten days at the beginning of August. She now asks me to thank heartily all those who so kindly contributed towards the expenses. She was suffering from phthisis of a rather chronic type, had also tuberculous caries of the bones of the left foot, and was extremely deaf. The following describes her condition on her return: According to the report of the radiographers, Dr. Hall-Edwards and Dr. Emrys-Jones of Birmingham, there was no improvement in either the condition of the lungs or foot, as evidenced by *x*-ray examination. A letter, however, received from the patient during the past week says: 'I feel very much better and stronger of myself; I never felt better, I think. The cough is very much better, indeed; the breathing is so much better; it never troubles me in the least; I am quite pleased about that. Before I went to Lourdes if I went upstairs I could not get my breath; if I walked about outside I could hardly speak to any one, I was so short of breath; now it has gone. The foot discharges yet, only I have not much pain of it. I have been in pain more or less for three years. I was twelve months and never put it down; then I got crutches for a short time only. I can walk very well indeed now, and much better; only if I walk too much it makes it a little angry and swollen at the ankle.' In another letter she says: 'All people here are quite pleased to see me much better and walking about.' The deafness, she says, is not improved. Contributors, I thought, would be glad to learn that there has been some practical result for their kindness." The case may be taken as a type of the cases which are accepted by devout believers as miraculous cures, wrought at Lourdes and elsewhere. Of objective amelioration there was none; the disease remained just as it was before the visit to the shrine. But there was considerable subjective improvement, though not more than is often observed, even in cases of cancer, when a new treatment which excites fresh hope in the patient's breast is tried.

FOR the convenience of members who have occasion to telegraph to the Medical Secretary, it may be stated that a telegraphic address, "Medisecra, London," has been registered for the purpose.

THE Harveian Oration before the Royal College of Physicians of London will be delivered by Dr. H. B. Donkin on Tuesday, October 18th, at 4 p.m.

A MONUMENT to Abbot Mendel, whose name is much in the mouths of students of heredity nowadays, has recently been unveiled at Brünn, where he died in 1884.

THE first woman who has qualified as a *Privatdocent* in Hungary is Dr. Irene Markbreiter, of the University of Kolozsvar (Klausenburg). She has worked for some years as assistant in the University Clinic.

THE President of the Metropolitan Counties Branch of the British Medical Association has accepted the Lord Mayor's invitation to serve upon the Mansion House Committee of the King Edward Memorial (London) Fund.

ON September 29th Dr. Robert Charles Brown, of Preston, whose public benefactions include not only munificent gifts to the infirmary of that town, but the foundation of a scholarship for research on special diseases at Cambridge, received the honour of the freedom of the borough. Dr. Brown was born at Preston on October 2nd, 1836, in the house in which he now lives.

ON September 30th Dr. Robert Marshall, Medical Officer of Health for Douglas, Isle of Man, was returned at the head of the poll as a member of the House of Keys. His programme was largely on public health. We understand that Dr. Marshall is the first practising medical man to be returned.

THE winter session of the London School of Tropical Medicine will open on Friday, October 14th. The Inaugural Address will be delivered by Dr. H. A. Miers, Principal of the University of London, at 3 o'clock. Sir West Ridgeway will be in the chair. The school dinner will be held the same evening at the Hotel Savoy under the presidency of Mr. James Cantlie. Among the guests will be Dr. Miers, the orator of the day; Sir West Ridgeway; Mr. E. Blessig, by whose generosity the school has been enabled to double the size of its laboratories; and Lord Sheffield, a munificent benefactor of the school.

A COURSE of clinical lectures and demonstrations will be given by the medical staff of the National Hospital for the Paralysed and Epileptic, Queen Square, on the Tuesdays and Fridays of October, November, and December, at 3.30 p.m. These courses are open free to practitioners and students. A special course of lectures and demonstrations will be given on the Tuesdays, Wednesdays, and Thursdays during November and December by Dr. Gordon Holmes (The Clinical Anatomy of the Nervous System); Mr. Donald Armour (The Surgery of the Nervous System); and Dr. James Collier (The Clinical Examination of Cases of Disease of the Nervous System). The fee for the whole course will be five guineas; for any one of the three parts of the course, two guineas. Application should be addressed to the Secretary at the Hospital.

England and Wales.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

MANCHESTER.

THE MANCHESTER ROYAL INFIRMARY.

AT a meeting of the Board of Management of the Royal Infirmary, held last week, the question of the advertisement for an honorary assistant surgeon was considered, and a letter was read from the Association of Fellows of the Royal College of Surgeons of Ireland containing the following resolution:

> The attention of the Association of Fellows of the Royal College of Surgeons in Ireland having been drawn to an advertisement of the Manchester Royal Infirmary and Dispensary for an honorary assistant surgeon, where it was stipulated that the candidates must be Fellows of the Royal College of Surgeons, England, this association hereby protests against such invidious distinctions being drawn between the Irish and English colleges, inasmuch as the fellowship of the Irish college is in every way equal to that of the English college, and also that some of the most eminent surgeons in England at present are Fellows of the Royal College of Surgeons in Ireland.

A letter was also read from Dr. S. Wesley Wilson, of Dublin, late Registrar to the Medical Council for Ireland, congratulating the board on excluding Fellows of the Royal College of Ireland from the post of assistant surgeon, and commenting on the way in which that diploma had been given previous to the year 1902. Both letters were referred to the Medical Board for consideration. The Medical Board afterwards met, and after considering the letters recommended that no action should be taken in the matter.

PENSIONS FOR NURSES.

On September 27th, in the Manchester Town Hall, the Lord Mayor presided at a large meeting of nurses at which Mr. Louis M. Dick, the Secretary of the Royal National Pension Fund for Nurses, gave an address on pensions for nurses. He said that after the age of 40 nurses began to find difficulty in getting work, most failed to do so after 45, and very few could earn a living at 50. The National Pension Fund was essentially co-operative, and no money was paid to agents. It was more of a club than a company, though it was run on strictly business lines, and through it nurses could not only secure pensions, but could insure against sickness and accident. Bishop Welldon, Dean of Manchester, said that more than 1,000 nurses joined the fund every year, and many who were already members were constantly taking out fresh policies increasing the sum to be drawn when they received their annuity. Over 1,000 nurses were now drawing annuities, and each year more than £2,000 was distributed in sickness and accident allowances. The Lord Mayor earnestly advised all nurses to join the fund, which offered opportunities for providing for old age that no nurse should neglect.

MONSALL HOSPITAL.

The Manchester City Council recently applied to the Local Government Board for permission to borrow £5,600 for the erection of a convalescent pavilion at Monsall Hospital, and on September 27th Dr. E. P. Manby, Local Government Board Inspector, held an inquiry at the Town Hall. The Town Clerk explained that since 1898 the urban districts of Withington, Moss Side, Gorton, and Levenshulme had been added to the city and the population had thereby been increased by nearly 200,000 which to some extent would account for the additional accommodation needed at the hospital. By the erection of the proposed pavilion about 48 beds would be released. The building was to be a substantial one, and it was thought that the thirty years generally allowed for repayment of the loan was too short a period. In the present state of the Manchester rates it was most important that every assistance should be given, and it was hoped that the time for repayment would be extended to at least forty years. Evidence in support of the application was given by Dr. Niven, the Medical Officer of Health, and there was no opposition. The inspector said that before giving his opinion he would visit the hospital.

The daily average number of patients in the hospital during 1909 was 341, which is much higher than the previous year. The most remarkable feature of the year has been the great pressure on the accommodation for scarlatina, as for many weeks the hospital was quite full and fresh cases had to be refused admission. The accommodation for diphtheria was also so heavily taxed that for a time one of the other large wards had to be used. During the year there were admitted 1,981 cases of scarlatina, 332 diphtheria, 236 enteric fever, 57 erysipelas, 54 puerperal fever, and 193 other diseases, a total of 2,853 admissions, of which 363 remained in hospital at the end of the year. As is usual during epidemics, the mortality of the scarlatina cases was high, being 5.7 per cent. This high rate is also partly explained by the selection of the most urgent cases for removal. The percentage of septic complications, such as otorrhoea, is also high, being 17.2 per cent. Only one case of post-scarlatinal diphtheria occurred during the year, which is by far the lowest recorded, and is remarkable, seeing that in 1901 no less than 104 such cases occurred. The return cases were also lower than previously, numbering 113, the number of alleged originating cases being 105, or 5.68 per cent. But as 25 of the "secondary" cases only commenced over three weeks after the discharge of the alleged primary case, it is highly probable that the figure 105 is too high, and that some of the so-called secondary cases were infected from some other source. The Medical Superintendent, Dr. Arnold, says that in all probability the return case figure should be put at about 3.9 per cent. He sees no reason for believing, what is often stated, that the association of patients together in hospital may increase the virulence of the specific organism. It is possible that more than one disease is often isolated under the name of "scarlatina," which may account for some of the return cases. The mortality from diphtheria was 18.3 per cent., which is lower than the previous year, but is still far too high. Tracheotomy was performed in 100 cases, out of which 29 died. Some form of post-diphtheritic paralysis occurred in 6.8 per cent. of all the cases, and otorrhoea in only 1.5 per cent., the last figure being remarkably less than in the scarlatina cases. All patients with diphtheria or scarlatina are examined for diphtheria bacilli before being discharged from the hospital.

LANCASHIRE POOR LAW UNIONS.

At the conference of the North-West Poor Law District, held last week at Morecambe, Mr. J. H. Sinkinson, Clerk to the Haslingden Board of Guardians, dealt with the proposals of the Right Hon. Charles Booth for Poor Law Reform. He said that many of the reforms urged by the Royal Commission had already been set afoot; for instance, the giving of more adequate relief, the case-paper system, abolition of pay stations, appointment of women officers, co-operation with local charities and nursing associations, removal of children from workhouses, and the extension of the boarding-out system. Some of the major reforms, however, such as the problems of vagrancy, of the feeble minded, the sane epileptics, and the ablebodied, could hardly be grappled with by the unions as at present constituted. To deal properly with these problems larger areas of administration were needed or combinations of unions. The proposal of Mr. C. Booth for urban Lancashire was to set up three great Poor Law boards as follows:

(1) The Manchester District Poor Law Board, which would cover parts of Lancashire, Cheshire, and Derbyshire, and would embrace ten existing unions—namely, Manchester, Salford, Chorlton, Prestwich, Stockport, Glossop, Barton-on-Irwell, Ashton-under-Lyne, Bucklow, and Hayfield. The population of this district at the last census was 1,467,089.

2. The Liverpool, Birkenhead, and South-West Lancashire District Poor Law Board, covering parts of Lancashire and Cheshire and embracing nine unions with a population of 1,618,237—namely Liverpool

Toxteth Park, West Derby, Birkenhead, Wigan, Prescot, Warrington, Leigh, and Ormskirk.

3. Mid-Lancashire District Poor Law Board, embracing ten existing unions, with a population of 1,584,314—namely, Bolton, Rochdale, Oldham, Bury, Blackburn, Haslingden, Burnley, Preston, Fylde, and Chorley.

Some parts of North Lancashire were to be grouped with Northumberland and Cumberland or with the North and West Ridings of Yorkshire. The three great district boards were also to combine to form a joint committee to provide and administer institutions for lunatics, the feeble-minded, sane epileptics, and the able-bodied. Mr. Sinkinson emphatically declared that he did not think it possible for boards of this description to administer the present or a revised Poor Law as efficiently as the present boards of guardians did their work to-day. He was astounded to find that when Mr. Booth turned from dealing with rural England to schemes for urban England, the principle of strong local control was thrown to the winds.

It may be mentioned that within the last fortnight the Chorlton Guardians, in future to be known as the South Manchester Guardians, have received a communication from the Local Government Board informing them that the Board has made an order constituting the seven townships of Burnage, Chorlton-cum-Hardy, Didsbury, Gorton, Levenshulme, Moss Side, and Withington into one township for Poor Law purposes, to be named the South Manchester Township.

BIRMINGHAM.

GUILD OF ST. LUKE.

THE annual festival service of the Birmingham Ward of the Guild of St Luke will be held on Tuesday, October 18th, at 4 15 p.m. in the Worcester Cathedral, when the sermon will be preached by the Very Rev. the Dean of Worcester. All medical practitioners are cordially invited to attend.

BRISTOL.

REPORT OF MEDICAL OFFICER OF HEALTH.

THE annual report of the medical officer of health for 1909 contains, in addition to the usual survey of the health of the city, special reports on outbreaks of small-pox and typhoid fever that occurred in the city during the year. Small-pox appeared in January, and continued to recur at intervals till May, the total number of cases being 39, of which 9 proved fatal, with several more cases in the neighbourhood. The first case was observed in a labourer working in the dock. He unfortunately took a tram journey of three miles, coming in contact with 395 persons, all of whom were kept under observation, involving 5,147 visits. From this man 9 cases were traced. During these cases 2 cases occurred in St. George, and inquiry into these brought out the following circumstances:—On February 12th, a case of variola nigra appeared in a village called Wick, and the patient died on the 16th without the nature of the illness being recognized. Twenty-four cases were traced to this one—2 of the workers at the Cossham Hospital, 2 ambulance men, 2 nurses, a patient in the hospital, the patient's two sons, 2 men who carried his coffin and 3 that attended his funeral, 1 of these taking the disease to Yeovil and infecting 5 persons. The third group of cases occurred in Bedminster, the family being related to the patient at Wick, though the actual source of infection could not be traced. Nineteen cases occurred in all with 4 deaths. A photograph is reproduced to show the mildness of an attack in 2 vaccinated children who had taken the disease from their unvaccinated brother—a confluent case. Dr. Davies points out that the type of the disease was an extremely virulent one, there being 3 haemorrhagic cases, this virulence being specially marked in the Wick case, where practically every one who came in contact contracted the disease. He further calls attention to the decreasing vaccination-rate and the risks that the city runs, and the possibility of some day it having to pay the penalty. The cost of the epidemic to the city appears to have been ridiculously small, for in non-small-pox days the hospital costs £695 for six months, and only an additional £14 when fully engaged in nursing small-pox. This is for the hospital alone, for the outbreak in one way and another cost £134 to the city. The amount of work involved was enormous, over 16,000 visits being paid by the inspectors to suspected cases, and 209 by the medical officers. The fright caused by the epidemic had the salutary effect of 22,000 persons being vaccinated.

Of enteric fever there were 66 cases, the smallest number since 1890. The most notable cases were those of one family of which 5 members suffered, and a second family in which 6 members contracted the disease, the two families living in the same street; 19 cases were traced in all from one source.

Coming, then, to the general matters of the report, Dr. Davies tells that the population of the city is 377,642 (estimated), that there were 8,507 births (rate 22.5, a decrease), 4 869 deaths (rate 12.89, a decrease). Of these deaths, 860 were of infants under one year—a rate of 101 to every 1,000 born. The zymotic death-rate was 0 9 per 1,000 living, the lowest on record for Bristol except for 1907.

Of diphtheria there were 712 cases with 55 deaths, or 7 per cent.—a great difference from 1894, when it was 39 per cent.; in fact, since that date the case mortality has continuously fallen. Infantile diarrhoea accounted for 116 deaths, a rate of 0.3 per 1,000 living.

From tuberculosis, 391 deaths from phthisis and 133 from other tuberculous diseases were recorded.

The report ends with the usual meteorological report supplied by Mr. H. Harding. It will suffice to say the rainfall was 4 in. above the average.

Scotland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

OPENING OF THE WINTER SESSION.

THE classes in the Faculties of Medicine and of Science in the University of Edinburgh, and the medical classes in the Extramural School of Edinburgh, were opened for the winter session on Tuesday, October 4th. In most cases the work of the session was entered on without the formality of introductory lectures.

CONTROL OF THE MILK TRADE.

A committee of the Scottish Chamber of Agriculture has issued an interesting report on the Sale of Food and Drugs Act in relation to milk. The committee considers that there would be no objection to the present law if the composition of milk were constant, or if it were possible to foresee or prevent variations. Unfortunately this is not the case. Since the passing of the Act of 1899 it has been proved conclusively by experiments conducted in all parts of Great Britain that the milk of single cows frequently varies within wide limits, and that marked variations occur occasionally in the mixed milk of considerable numbers of cows, so that such milk does not in every case contain the presumptive percentage of butter fat. The committee considers that the following are the principal objections to the present law:

1. That the person who sells milk which is genuine but poor is unduly exposed to the risk of being charged under the same section of the Acts, and made liable to the same penalties and subject to the same stigma as a person who is guilty of fraudulently adulterating milk or fraudulently selling adulterated milk.
2. That the position of a milk seller is aggravated by the fact that he has very often no means of knowing whether the samples taken from his milk fairly represent the bulk.
3. That in many cases prosecutions are instituted without the consideration which so serious a step demands, and on the advice of officials who have not the necessary expert knowledge.

4. That part of the evidence brought against farmers and others, when charged with the sale of adulterated milk, is presumed against them, whereas in most other proceedings of a criminal character the prosecution are under the obligation of proving the whole of their case.
5. That the dismissal of a case against a retailer, on the evidence of himself and his servants, may involve the seller to him in a prosecution for false warranty.
6. That (in Scotland) the farmer who successfully defends himself in a milk prosecution has to pay his own costs.
7. That under the law, as laid down in Smithies *v.* Budge, it appears that a seller of genuine milk is always liable to be convicted of an offence if the court holds that the milk is not of the quality demanded by the purchaser.

In suggesting measures to be taken to meet the above complaints, the committee has kept in mind the following considerations: The change must either be (1) an improvement in administration, or (2) an amendment of the law. As to (1) the committee, while believing that improvement in the administration of the existing law is needed, and can be effected, is of opinion that no such improvement can be suggested as would fully meet the needs of the case. There is no method of discriminating with certainty between cases where milk is adulterated and cases where it is poor but genuine. The task of attempting to discriminate is so difficult as to be beyond the power of many officers of local authorities. The risk that sellers of genuine milk may be prosecuted is, therefore, inherent in the present system. They are further of opinion that any method of administration which entailed prosecution for selling genuine but inferior milk would have the effect of rendering the law a dead letter, so that dishonest persons could adulterate with impunity. As to (2) the committee has carefully considered whether any amendment of the law is possible and desirable, and it has come to the conclusion that the answer to both questions is in the affirmative.

It appears to the committee that it is necessary to provide for two distinct subjects: (1) the adulteration of milk; and (2) the sale of milk of poor quality with regard to which there is no evidence, except the quality, that adulteration has taken place. With regard to adulteration, the committee is of opinion that the law might be strengthened in several respects. With regard to the sale of milk of poor quality, the committee desires to point out that at present, when a public analyst certifies that milk is of a poor quality, the local authority must either take no action at all (beyond cautioning the vendor) or it must resort to criminal proceedings. The committee has come to the conclusion that it is to the interest both of the public and of the milk seller that local authorities should be in a position to control the sale of such milk without instituting criminal proceedings. This object might be attained by setting up a standard of quality in place of the existing limits, on which a presumption of adulteration is based, and allowing local authorities to enforce the standard of quality by claiming from any seller of milk below the standard a sum of money by way of compensation or damages. To carry out the suggestion above laid down, the committee suggests, among other provisions, that in cases where a criminal prosecution is instituted in connexion with the sale of milk, it should be incumbent on the prosecuting local authority to show guilt on the part of the person charged; it should be made an offence to permit separated milk or skimmed milk to be in or on any public place except in vessels clearly marked; it should be made an offence for any registered milk seller, or his servant, to mix with water or separated milk, or with skimmed milk, or with any other extraneous substances, or to have in his possession a mixture of such milk with water or with separated milk or with other extraneous substance, unless he proves that it was not intended for sale; that officers of local authorities should have the same right as under the Butter and Margarine Act to enter premises used as premises of a milk seller to ascertain whether water or skimmed or separated milk or other extraneous substance is being mixed with milk therein; a fixed standard of quality of milk, namely, 3 per cent. of butter fat and 8.5 per cent. of solids not fat, should be set up in place of the limits on which, under the present law, a presumption of adulteration is raised; to enforce the standard of quality referred to, it should be provided that, if milk containing less than the prescribed percentage of fat and solids is sold as milk, the seller should be liable to pay to the local authority of the district a sum of money not exceeding forty shillings for each sample taken under the sale of Food and Drugs Act and found defective, which sum should be recoverable, if necessary, in a county court, but not as a penalty on conviction. The committee are also satisfied the proposed changes would bring about a better milk supply, both directly by preventing adulteration and discouraging the sale of poor milk, and indirectly by making the business of producing and distributing milk a more suitable occupation for men of the class who object to have their names associated with police court proceedings.

THE SMOKE ABATEMENT LEAGUE OF GREAT BRITAIN.

The first annual conference of the Smoke Abatement League of Great Britain was held in Glasgow on September 28th. The members and delegates attending were received in the City Chambers by the Lord Provost. Among those present were representatives from 30 English municipalities, 160 delegates from various parts of Scotland, 2 from Ireland, and 70 members of the Glasgow and West of Scotland Branch of the League. The different phases of the smoke question were dealt with, the health aspect being particularly emphasized by the Glasgow Medical Officer of Health and Councillor Shelmerdine, chairman of the Health Committee of Liverpool Corporation. There was a consensus of opinion that uniform legislation was required for city and county authorities alike, so as to grapple adequately with the admitted evils of smoke pollution.

The Lord Provost, in his opening address, referred among other evils to the destruction of life caused by the smoke pollution, and said that the Registrar-General took special notice of the last fog visitations to Glasgow, and in his report called the attention of the Secretary for Scotland to the sudden rise which took place in the death-rate of the city. He noted that while in September and October the death-rate was 13.5 and 13 per 1,000 respectively, it rose in November and December to 24.9 and 25.1. The children under 5 years who died in September and October in the city numbered 851, while the number rose in November and December to 1,492. These official figures spoke all too plainly of the mischief due to the condition of the atmosphere.

Dr. A. K. Chalmers, medical officer of health for Glasgow, in his paper dealing with the medical aspect, also emphasized the danger by recording the death-rates of those months when fog was prevalent, extending the reports over a series of years. He also stated that while in November and December the maximum possible hours of sunshine which could be recorded on a sundial were 210 and 172, and above the horizon 247 and 216 respectively, the hours of bright sunshine recorded in November and December last year were only 63; in 1908, 43; in 1907, 36; and in 1906, 46. He advocated the establishment of a meteorological station in the Clyde Valley similar to that already existing in the Thames Valley, whereby it would be possible to foretell by a few hours the advent of conditions which produced these dense fogs.

VETERINARY PROBLEMS AND PUBLIC HEALTH.

The annual meeting and conference of the Association of Veterinary Officers was held in the City Chambers, Glasgow, on September 29th. Mr. J. S. Lloyd, President, was in the chair, and representatives were present from all parts of the United Kingdom. After the business meeting the conference discussed various veterinary problems in their relation to public health. The President, in his address, referred to the representations made to the Local Government Boards of England, Scotland, and Ireland for the appointment of a veterinary surgeon to each Board, and also urged the establishment of a uniform system of meat inspection. As the outcome of these representations

Scottish local authorities had arranged for a combined deputation to meet the Secretary for Scotland in the course of this month.

Papers were contributed on the eradication of animal tuberculosis by Professor Bang, of Copenhagen, and Professor Ostertag, of Berlin, and after discussion a resolution was adopted urging the Government to take immediate measures to diminish the frequency of tuberculosis in food animals by the slaughter of all cases of open tuberculosis, by encouraging the formation of tubercle-free herds, and by the universal enforcement of the Dairies, Cowsheds, and Milkshops Orders. A resolution was also adopted stating that it was imperative that the manufacture of tuberculin should only be permitted in approved laboratories, and that permission should be issued only to members of the medical and veterinary professions.

Dr. J. A. Murray, of the Imperial Cancer Research Fund, read a paper on cancer in domestic animals, and Professor John Glaister, Glasgow University, dealt with the standard by which the fitness or unfitness of flesh meat for human food should be gauged. The important question to be decided, he thought, was whether the standard was to apply to the nature and quality of the food when purchased, or was to be used as a criterion of fitness after efficient cooking. The sale of meats covered with moulds differed from the sale of cheese which was mouldy. Moulds on meat might or might not be rendered innocuous by cooking. He did not think, however, that the question of efficient cooking should ever enter into the standard of fitness, and the conference supported the proposal that all meat covered with moulds should be condemned. Professor Dick (Edinburgh) contributed a paper on the relation between scarlet fever, diphtheria, and sore throat in man and diseases of the udder and teats of cows, dealing with the question of infection through milk.

Edinburgh was chosen as the centre for next year's conference, Mr. Wm. Robb, F.R.C.V.S., Glasgow, being selected as president. Mr. A. M. Trotter, Veterinary Surgeon to the Corporation of Glasgow, was re-elected secretary and treasurer.

THE LATE DR. ROBERT SPENCE, BURNTISLAND.

A public memorial to the late Dr. Spence has been fully subscribed for at Burntisland, and has taken the form of an ionic cross about 12 ft. high, of symmetrical proportions, in grey granite. Ornamental metal tablets with suitable inscriptions will be placed in the free library and in the parish church. The Memorial Committee at Aberdour have chosen a public clock, which will adorn the wall in front of Aberdour parish church.

MEDICAL SCHOOL INSPECTION.

The annual reports of the medical school inspectors are now making their appearance. Dr. Finlator, the School Medical Officer for Clackmannanshire, has just issued his first annual report. Since his appointment only one medical inspection has been possible. The number of routine cases examined was 397, and the cases specially presented numbered 193. Of the 397 routine cases, 107 required medical attention, 83 had four or more decayed teeth, and 65 had verminous heads, 57 of whom were girls and 8 boys. Referring to this in particular Dr. Finlator says: "The figures relative to verminous heads are instructive. The high percentage of girls affected compared with boys is due to the fashion of wearing the hair long. If fashion ordained that school girls should wear the hair short, the evil of verminous heads would be easily stamped out." It is also stated in the report that a large number of children suffer from defective vision, and the number of cases of ear disease and defective hearing is fairly large. The objections to medical inspection on the part of parents did not average more than ½ per cent.

CRYPTOGAMIC SOCIETY OF SCOTLAND.

As showing the numerous varieties of fungi and lower forms of plant life encountered in a day's ramble, it may be mentioned that at the thirty-fifth annual conference of the Cryptogamic Society, held on September 27th at Crieff, over 100 different species were identified and catalogued. The attention of the Cryptogamic Society is devoted to the lower forms of plant life (ferns, mosses, etc.), but particularly to the fungi which abound in woods and pastures during the autumnal season.

TREATMENT OF PHTHISIS AT GREENOCK.

At the meeting of the Greenock and District Combination Hospital Board, held on September 30th, reference was made to the offer of Councillor Orr to erect a sanatorium for the treatment of phthisis within the hospital grounds. Dr. Whiteford, while appreciating the offer, was of opinion that the site was not a suitable one in the interest of the convalescent patients of the hospital, and it was considered desirable to go into the whole matter thoroughly and have a detailed report. A committee was appointed for this purpose.

EPILEPTIC COLONY AT BRIDGE OF WEIR.

At the biennial thanksgiving and commemoration day in connexion with the Orphan Homes of Scotland at Bridge of Weir an interesting statement was made regarding the Colony of Mercy for Epileptics. A new house, costing about £4,000, was nearing completion, and would accommodate 30 epileptic boys and girls. There are now three houses in the colony, one each for men, women, and children. In addition, houses have been erected for the use of the doctor and the superintendent-physician. In addition to the 1,350 children in the Orphan Homes, there are 122 phthisis patients in the adjoining sanatoriums and 54 inmates of the epileptic colony, the income for the past eleven months for these being £25,169 for the orphan homes, £7,222 for the sanatoriums, and £3,147 for the epileptic colony. During the thirty-two years of the existence of the homes £853,290 had been gifted for their upkeep and 15,000 orphan children had passsd through them.

Ireland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

PHILANTHROPIC REFORM ASSOCIATION.

SPEAKING on the subject of Poor Law reform at a recent meeting of the Philanthropic Reform Association, held by the invitation of the Countess of Meath at Kilruddery, Bray, Lord Meath stated that amongst the reforms which he regarded as most essential was that there should be a more complete and thorough classification of the inmates of Poor Law institutions than at present existed. By classification was meant that the aged, the lunatics, the invalids, and the able-bodied were to be kept in separate buildings and under different treatment, and in order that this might be carried out it was necessary that the unions should be amalgamated into larger districts, and the rates for these institutions levied over larger areas. The simplest and most radical way of effecting the change would be to give the county councils the whole of the duties now discharged by the Poor Law guardians, and the committee of the Philanthropic Reform Association was in favour of this proposal with certain reservations. As far as the question of unemployment was concerned the committee concurred in the recommendation of the Royal Commission that the care of the able-bodied should be withdrawn from local authorities and entrusted to the State. As regards sane epileptics, Lady Meath's offer to establish a home for a certain number of sane epileptics on condition that some body of persons could be found willing to maintain it and carry it on, was still open, but so far no such body of persons had accepted the offer. The Belfast Corporation had, indeed, agreed to build such a home provided that the cost of maintenance would be borne by the Government and the Poor Law guardians, but the Government had not only objected to contribute but had also pointed out that it was illegal for the guardians to do so. On this subject a

bill had been drafted, and the association hoped that it would shortly be passed as a non-contentious measure. Subsequent to Lord Meath's speech a resolution was proposed and adopted calling on the Government to give powers to boards of guardians to maintain sane epileptics, and requesting that a capitation grant of 4s. a week should be made by the Exchequer towards their maintenance.

HONOUR FOR SIR CHARLES CAMERON.

At a special meeting of the Corporation of Dublin held on Friday, September 30th, the following resolution was proposed and passed unanimously:

> That this Council, recognizing the distinguished services given to the City of Dublin by Sir Charles Cameron, C.B., M.D., and the fact that these services have conferred lasting benefit upon the citizens: That almost half a century of devoted exertion on his part to the extermination of disease and everything inimical to public health within the city has resulted in a courageous and efficient public health organization: That, owing to his ceaseless efforts, Dublin, which at one time had, from the sanitary point of view, an unsavoury name, can now boast of comparative freedom from almost all of the malignant diseases which assail mankind: And, as it is due mainly to the untiring enterprise of Sir Charles Cameron, and to the advice which he gave to, and upon which the Municipal Council acted, that so excellent a state of public health now obtains in Dublin: Therefore, Sir Charles Cameron be, and he is, hereby, constituted an Honorary Freeman of the City of Dublin; and that he be, and he is, hereby elected and admitted an Honorary Burgess of this County Borough, pursuant to the provisions of the Municipal Privileges (Ireland) Act, 1875.

ASYLUM CAPITATION GRANTS.

Under Section 58 of the Local Government Act of 1898 capitation grants are made to each county council which has kept its lunatic asylum well managed and in good order, but this year, owing to the insufficiency of the amount paid to the Local Taxation (Ireland) account for the financial year to meet the sums payable thereout in the same period, considerable reductions in the grants are anticipated, with the result that the deficit will necessarily be made good by local taxation. Already the County Councils of Roscommon and of South Tipperary have been notified of a reduction of 32 per cent. of the grant, and a still greater reduction has been made in the case of the South Riding of Tipperary. The South Tipperary County Council has passed a resolution of protest against the reduction.

THE HEALTH OF BUNDORAN.

Rumours concerning the existence of numerous cases of "fever" in Bundoran have lately been widely disseminated, and have apparently affected that seaside resort adversely as far as summer visitors were concerned. In consequence, some of the well-known residents have, through the medium of the daily press, informed the public of the actual state of affairs. It appears that sixteen cases of typhoid fever actually occurred during the month of August, but that no fresh case has appeared since then. Only one case of scarlatina has been notified during the present year, and there has not been a single case of typhus or diphtheria. The water supply is stated to be absolutely pure, and in comparison with neighbouring towns the record of Bundoran, as far as febrile diseases are concerned, is said to be extremely good. The residents complain of the wild stories that have been current, and are anxious that the actual facts should be known.

LONGFORD WORKHOUSE.

Following on an inquiry recently held by the Local Government Board into alleged irregularities in the management of the Longford Workhouse, and into the death of a patient whilst being removed to the fever hospital in the ambulance, the Board called upon the guardians to request the master of the workhouse and one of the nurses to resign. As, however, the inquiry in relation to the death of the fever patient had not been completed, the guardians replied that in their opinion the conduct of the two officials referred to was not such as to call for their resignation, and that they had decided to postpone the matter until all the questions at issue had been inquired into. To this the Local Government Board replied that the charges proved against the master and the nurse—namely, total incompetence in the management of the workhouse, and the misappropriation of clothing belonging to patients—had no connexion with the subject matter of the impending inquiry, and that it again called on the guardians to obtain the master and nurse's resignation. Following upon this the guardians have drawn out a long reply to the Local Government Board refusing to carry out the Board's recommendation, and here the matter rests for the present. As no attempt is made to deny the charges made by the Board, although numerous excuses are forthcoming, the position of the guardians is certainly unedifying, and forms a commentary on the methods of Poor Law administration in some parts of Ireland.

DWELLING-HOUSES IN PORTUMNA.

In consequence of an outbreak of typhus fever in the Portumna district, Dr. Kennedy, the medical officer of health, was requested to inspect some of the houses, and he has now reported to the District Council that many of the dwelling-houses are in a condition dangerous to health. In one house a bedroom had been converted into a stable. It was full of straw and manure, and a donkey was housed there. In another house a portion of a bedroom was devoted to the rearing of chickens, while in many houses the roofs were leaking, the floors irregular, and there were no sanitary arrangements. As a result of this report the council has decided to have an inspection made of all the houses in the town, and to defer action until this is completed.

India.

[*FROM OUR SPECIAL CORRESPONDENT.*]

PALUDISM.

THE proceedings of the important conference on malaria which was held in Simla in October, 1909, have been referred to in the BRITISH MEDICAL JOURNAL (vol. i, 1910, p. 597), and the recommendations which resulted from the deliberations of that representative assemblage summarized. The provincial committees whose organization was suggested by the conference have been embodied, and a central scientific and advisory committee appointed at Simla, consisting of Lieutenant-Colonel J. W. W. Leslie, C.I.E., I.M.S., President; Lieutenant-Colonel D. Semple and Captain Christophers, I.M.S., members; and Major S. P. James, I.M.S., Secretary. These names are an earnest of solid, continuous, and fruitful endeavour to promote the cause of malaria prevention by means of persistent study and the application of feasible measures. A course of instruction was conducted at Amritsar in the Punjab by Captain Christophers in March last, which was attended by delegates from the various provinces, and appears to have been very successful and much appreciated. A central malarial bureau for the storing of books, collections, and apparatus relating to malarial research, is to be established at Kasauli, and it has been decided that a journal or bulletin shall be issued every three or more months in order to give publicity to the results of work done by the various agencies which have been instituted in connexion with this systematic investigation.

The first number of this periodical has been published. It is edited by Major James, and entitled, *Paludism: being the Transactions of the Committee for the Study of Malaria in India.* There is a prefatory note by the editor giving a clear summary of the deliberations and recommendations of the Simla conference and of the orders and events which have been the outcome of the congress. Then follow articles on investigations relating to quinine; a short syllabus of the work done at the malaria class held in Amritsar during March and April, 1910; suggestions on the use of available statistics for studying malaria

in India, by Captain Christophers; notes on mosquitos, by Major James, including the description of a new anopheline (*Christophersia halli*); and the number concludes with a list of papers relating to malaria, published in India and elsewhere, with critical *précis*. This statement of the contents of *Paludism*, No. 1, indicates its valuable scientific and educational character. The study of malaria is now being prosecuted in India with great intelligence and industry, and, in view of the serious sickness and mortality caused by paludal disease, no subject is deserving of closer and more anxious research than this. There is every hope that the movement so energetically started will be productive of great saving of suffering and life in India and elsewhere.

LAHORE MEDICAL COLLEGE.

The *Tribune* of Lahore in several recent leading articles, sent to us for comment, makes a complaint regarding hardships alleged to be suffered by Indian medical students who fail to pass the final qualifying examinations for the licence in medicine and surgery at the Lahore University.

It would appear from what our contemporary says that there is a general impression in India that if such "failed" students can only go to England they will have no difficulty in passing one of the "easier" professional examinations in the United Kingdom and in getting on the British *Register* with a British diploma and all the attendant advantages. The difficulty, we are told, which lies in their way is that the Punjab Government has ruled, in the official prospectus of the Lahore Medical College, that when such "failed" students apply for certificates of the attendance at all the courses of lectures required by the British qualifying bodies, they must pay a fee of Rs.35 (£2 6s. 8d.) for each certificate of a course of lectures or of hospital instruction.

The *Tribune* seems to assume that when a student has failed to pass at Lahore such failure is final, and that his only chance to become a qualified medical man is to incur the heavy expenditure of (1) a journey to England and back; (2) a stay there of at least six months; (3) medical school fees, and (4) the examination fees. The "failed" student, we are told, is unable to take this step because at the outset he has to provide himself with certificates costing, according to the *Tribune*, about Rs.350 (£23 6s. 8d.), and this is called "monstrous and inhuman," and the "failed" student "adds to the wastage of Indian youth."

It seems to us that what the "failed" student has to do is to buckle to work again and try to satisfy the Lahore examiners at a subsequent examination. But if he can afford to come to England to obtain one of the "easy" British qualifications, surely he can afford to pay the relatively small sum of £23 odd to provide himself with the certificates which the British examining bodies require.

We have referred to the prospectus of the Lahore Medical College for the year 1908. We find that for full courses of instruction similar to those at British schools, "each student shall pay a fee of Rs.50 (£3 6s. 8d.) in advance each year, and, in addition, a fee of Rs. 5 (6s. 8d.) for each course of dissection." The curriculum extends (or extended in 1908) over four years, so that a complete medical education is offered by the Punjab Government to students for, to European ideas, the absurdly low sum of £13 6s. 8d. plus 13s. 4d., for two courses of dissection including "parts." A subsequent rule lays down that "any matriculated student who leaves the college with the object of continuing his studies elsewhere, may receive certificates of attendance at lectures on payment of fees at the following rates: For each certificate of attendance on a course of lectures or hospital instruction, Rs.35."

The complaint seems to us an unreasonable one, because for fees amounting to another Rs.50 (£3 6s. 8d.) the "failed" student can attend at Lahore lectures and hospital instruction for another year, at the end of which he ought to be able to pass. The above-mentioned alternative of a journey to England would surely cost him or his friends fifty times as much at the lowest estimate. If he had small hope of passing at Lahore, we really must be allowed to think he would have no greater chance in Great Britain, though we are told the British examinations are so much less severe.

Our contemporary also brings what appears to be an unfounded complaint against the University of Lahore. The articles sent to us appear in several consecutive issues of the *Tribune*, and are not quite easy to follow, but the following would appear to be the facts of the case:

The Indian Universities Act of 1904 rules all the duties and functions of the Lahore University. We have obtained a copy, and have read through the Act. Sec. 25 (1) permits the Senate, with the sanction of the Government (in this case that of the Punjab) "to make regulations consistent with the Act of Incorporation as amended by this Act"; and (2) "such regulations may provide for" (amongst previous items) "(*i*) the inspection of colleges, and the returns, reports, and other information to be furnished by colleges"; and "(*j*) the registers of students to be kept by colleges affiliated to the university."

On May 8th, 1908, the syndicate decided that, as the rules of the Medical College (affiliated to the university) did not permit of the issue by the college of certificates of attendance except on payment of Rs.35 for each course, the university should grant such certificates for a nominal office fee of Rs.10, apparently for the whole series. This rather extraordinary action of the syndicate, not authorized anywhere in the Indian Universities Act of 1904, and overriding the rules of the affiliated Medical College, was reaffirmed at a meeting of the syndicate on January 15th, 1909, according to the *Tribune*. What happened subsequently is not quite clear, except that the Principal of the Medical College is said to have refused the request of the university to supply the certificates, presumably gratis, as the students were only to pay Rs.10 (13s. 4d.), and that to the university! It goes without saying that such certificates usually have to be signed by the professors who deliver the lectures. Thereupon the Vice-Chancellor appointed a subcommittee to reconsider the question. The subcommittee duly reported, and the syndicate meeting on March 18th, 1910, rescinded its former order, which, as far as we can judge, was clearly *ultra vires*.

It seems to us that the desire of the Government in India is to offer students their complete medical education at a cost probably lower than in any other country, and at the same time to exact a standard of knowledge from those who obtain Indian degrees or diplomas which will compare favourably with that required for British degrees or diplomas, especially as these Indian university qualifications entitle their holders to admission on the British *Register*. It is quite easy to understand, therefore, that the authorities of the Lahore Medical College and the Punjab Government do not approve of students availing themselves of the very cheap Indian medical education, and then, after failing to reach the necessary standard for an Indian diploma, going to England and passing one of the "easier" British examinations. The number of diploma-granting bodies in the United Kingdom is an acknowledged anachronism, if not something worse.

We cannot offer our sympathy to the protegés of the Lahore *Tribune*, and we think our contemporary's articles show unnecessary warmth in an erroneous line of argument.

UNDER the will of the late Mr. William Bell, the following Liverpool hospitals each receives a bequest of £1,000: The David Lewis Hospital, Royal Southern, Stanley, Royal Infirmary, and Bootle Borough Hospital. A corresponding sum is left to the University of Liverpool.

UNDER the will of the late Mr. William Henry Kirkham, of Keymer, Sussex, gifts of £200 each are made to the Sussex County Hospital and the Royal Alexandra Hospital for Children, Brighton; and of £100 each to the Brighton, Preston, and Hove Dispensary, the Brighton Throat and Ear Hospital, and the Hospital for Women, Brighton.

Special Correspondence.

PARIS.

The Law Concerning Industrial Accidents.

THE French law on labour accidents, which makes employers responsible in regard to their employees who have met with an accident, is not exactly a new law; in it the scattered provisions have been consolidated into a definite and special law. In particular a tariff of pecuniary responsibility has been established which extends to the most immediate and commonest effects. This means that if formerly the law courts were able to judge of the indemnity payable in cases of permanent disablement or death, they had nothing to guide them in cases of claims made by physicians and surgeons, which are of far greater general importance and more extended application. In fact, accidents followed by a complete restoration of the power to work form the immense majority. There remain, therefore, from the point of view of damages, only the medical and pharmaceutical costs. This, especially in practice, is the object of the law, and it is for this reason that its action has excited so much interest among members of the medical profession.

If a workman has met with an accident, it is obvious that the medical attendants can claim to be paid for their services at the ordinary rate, since it is not a question of treating a destitute man on whose behalf we have made a special contract with the State which provides assistance. As a matter of principle there is no reason why they should make any reduction in such a case. In practice it is a different matter. The law has limited the employer's financial responsibliity according to a tariff, the details of which cannot be given here; it need only be said that it ranges between the ordinary scale of fees and that of free assistance for the poor.

If they ask ordinary fees which are on a higher scale, the employer, or the insurance company which takes his place, can refuse to pay the excess. Can they in such a case demand payment from the patient? Unfortunately, in most cases the workman is a poor man, who has been rendered poorer still by his accident. This is, therefore, practically out of the question. Moreover, the workman would not understand and would not submit to a law which did not free him entirely. Both the employer and the doctor understand the utter impossibility of such an arrangement.

The doctors, therefore, seemed obliged to accept the tariff laid down by the law, which bears the name of the Minister whose work it is, M. Dubief. In other words, they seemed obliged, as in matters of medical assistance, to bear a part of the cost of social generosity. It will be admitted that there is no reason founded on principle by which this enforced charity can be defended. Still more, it was unwise, because French doctors, who are at present too numerous, are justified in thinking that they are not rich enough to give alms so lavishly. When the doctor once discovers that, behind the workman who excites his interest and perhaps his pity, or the employer who he knows well is not always a flourishing manufacturer, and often needs just as much consideration as his employees, there is the anonymous insurance company with a capital amounting to millions, he is no longer disposed to let the benefit of the reduction of his fees fall into its coffers. Leaving aside, therefore, the legal tariffs, the doctors have taken the plausible course of presenting their real client, the insurance company, with accounts on the ordinary scale. On the other hand, the insurance company, relying on the terms of the law, and apparently failing to realize the enormous profit which it derives from fire and life insurance, has resisted the action of the doctors. Hence a conflict has arisen. At first sight the medical profession seems unarmed for this struggle. On the contrary, it is equipped with formidable weapons, and the insurance companies are not ignorant of this. Its interest is the same as that of the victim of the accident, inasmuch as both he and the doctor are equally indemnified in proportion to the duration of disablement, since both of them benefit by the care and frequency of medical attendances, the urgency and necessity, and the length of this—always freely claimed by the patient—are left to the discretion of the doctor, whose appreciation of them is controlled only by his conscience. A doctor may be tricked, but it is in his power never to be duped with impunity, and elementary prudence dictates that he should not be provoked too far, and that his scruples should be treated with as much delicacy as is expected of him. Thus, certain insurance companies, reckoning with the factor of competition, attempted to form advantageous arrangements with certain doctors whom they afterwards forced on their clients, with all the moral compulsion and persuasion which they could use—even going so far as to found special clinics with staffs paid on contract scales—thus destroying the bond between the doctor and the workman; and the others strove to tire out and discourage any opposition on the part of medical men to their rule by dragging them at every turn into the law courts. But wiser companies tried to establish a necessary agreement, and one at least of them even thought the difficulty solved by simply making the doctors their sole shareholders. This dainty device has not yet produced any remarkable results.

During this time the doctors have not been idle, and it may be said with perfect truth that it is their struggle with the insurance companies which has caused the great friendly society and syndicate movement of the past six years. They did not at first cease to safeguard the principle of free choice decreed by the law, proclaiming that they themselves intended to stand between the workman and the insurance companies, exempt from all pressure, without compromise or surrender. And gradually they are succeeding in securing recognition for a new conception, more precise and less sentimental, of their professional interests. Formerly, French doctors willingly adapted their fees to the means and social position of their patients, practically imposing on themselves, before the law required it, a sort of income tax—a procedure which was greatly to the taste of the public. At the present day society claims assistance for the poor. Therefore, medicine modestly attaches an intrinsic value to its work, independently of the individual who profits by it. On this value medical men have no longer any reason to allow a rebate, and they can therefore divest themselves of the privilege of paying a tax twice over.

VIENNA.

The Cholera Scare.—Professor Strümpell.

THE recent outbreak of Asiatic cholera in Russia has caused general alarm here, on account of the close commercial relations which exist between the two countries. The common frontier line between Russia and Austria extends for over 250 miles, and as it frequently happens that members of the same family dwell on either side of it, the strictest precautions are necessary to check any importation of the disease. According to the latest rules laid down by the Board of Health, not only must all persons crossing the Russian frontier into Austria submit to an eight days' quarantine and all goods imported from Russia be disinfected, but the importation of any article of food from the zone of infection is also absolutely prohibited. A special commission has been sent to each cholera centre in Russia, with the object of reporting on the spread of the epidemic and the measures taken to check it. In spite of all precautions, however, two cases have already been reported from Galicia (which lies along the border between the two empires), and this has given rise to some anxiety among the inhabitants, though it has been proved that in both cases the patients had quite recently been in Russia, and evidently had contracted the disease there. An official description, therefore, of the measures to be taken to prevent the importation of cholera germs, together

with an official assurance of the efficacy of these measures, has been distributed in the form of leaflets among the population of the frontier. All cases of gastro-intestinal disturbances have to be reported to head quarters, and the patient is sent to the State laboratory in order to be examined for cholera microbes. As far as can be judged from former results under similar circumstances, it seems quite certain that all danger of a cholera epidemic in Austria can be averted.

The news of the resignation of Professor von Strümpell, the successor of von Schrötter, has caused much surprise, not only amongst the members of his own profession, but also among the general public. It is only eighteen months since this eminent scientist most reluctantly consented to take over the third medical clinic, after the sudden death of von Schrötter, which occurred during the Laryngological Congress. His reluctance was so great that it was not overcome until he had received a solemn assurance that he would be at perfect liberty to bring the clinic up to the standard he required to make it a first-class teaching institution. From the very first, Strümpell found many obstacles to his work in this city; most of them were due to the officials, who were jealous of his position and the unusual honour which had been accorded to him. The money he required for the scientific researches of his clinic was paid only after repeated demands; and when finally, to crown all, he was refused a few hundreds for his work, his patience gave way and he sent in his resignation. He has accepted the offer made him by the clinic at Leipzig, where, instead of the 80 beds and three assistants, and the 1,000 marks a year, to which he has been accustomed at Vienna, he will have eleven assistants and nearly 200 beds, with a yearly income of 20,000 marks, besides ample laboratory and library facilities. It is easy to understand how tempting the offer of such a position must be in comparison with his position at Vienna. His students here lose an honoured and respected teacher, his patients a most genial physician, and his colleagues a wise leader and an excellent consultant. Above all, his departure leaves us with the bitterly humiliating conviction that once more medical science in our country has received another blow from men who ought to know that no sum of money is ever too great to spend upon education, and that it is never thrown away if the spending of it ensures good and efficient teaching.

Correspondence.

THE SEVENTEENTH INTERNATIONAL CONGRESS OF MEDICINE.

Sir,—I have received a notice to attend a meeting of the General Committee on Wednesday, October 12th, at 5 p.m., in the Library of the Royal College of Physicians. I notice that the date selected for the Congress—July 29th to August 6th, 1913—is the usual date of meeting of the British Medical Association. This must have been well known to the coterie whose identity is hidden under the cloak of W. P. Herringham, and therefore the selection of this date cannot possibly have been otherwise intended than as a direct insult to the British Medical Association.

I understand that the annual meeting of the British Medical Association in 1913 will be held in Aberdeen, and my very high opinion of the Aberdonians will considerably wane if they yield one inch or one hour to a comparatively mushroom institution like the International Medical Congress—a society without a home and without any backbone.

Although not the duty of the Council of the British Medical Association, I think it would be well if that body announced at once that the annual meeting of the Association in 1913 will be held at the usual time, and then, if we are to have a conflict between the two associations, let it be short, sharp, and decisive, and there cannot be much doubt as to the issue of the fight.—I am, etc.,

Liverpool, September 30th. James Barr.

Sir,—A meeting of the General Committee has been summoned by Dr. W. P. Herringham for October 12th at 5 p.m., to meet in the library of the Royal College of Physicians.

There is a report from the Advisory Board, but no mention is made as to the constitution of this board or the names of the members who attended the meeting and selected the office-bearers. These gentlemen also propose: "That the date to be submitted for the approval of the Bureau de la Commission permanente des Congrès Internationaux de Médecine as the date of the Seventeenth International Congress be the date July 29th to August 6th, 1913."

This is the usual date for holding the meeting of the British Medical Association, and there is a strong probability that the meeting may be held that year in Aberdeen; but wherever it be held the selection of that date by this "Advisory Board" cannot be looked upon otherwise than as a studied insult to the British Medical Association.

From the British Medical Journal of February 12th, 1910, we learn that this Advisory Board was constituted as follows: Sir T. Clifford Allbutt, Sir William Allchin, Sir Charles B. Ball, Sir Thomas Barlow, Bart., H. T. Butlin, Sir W. Watson Cheyne, Bart., Sir W. S. Church, Bart., Clinton Dent, Inspector-General J. Porter, Surgeon-General W. L. Gubbins, Surgeon-General A. M. Branfoot, G. A. Gibson, M.D., A. Pearce Gould, Percy Kidd, Sir William Macewen, G. H. Makins, Norman Moore, Sir Malcolm Morris, Sir Shirley Murphy, George Newman, Arthur Newsholme, Professor Osler, F. W. Pavy, Sir Douglas Powell, D'Arcy Power, Seymour J. Sharkey, Charters J. Symonds, Sir John Tweedy, and Sir William Whitla.

It would be very interesting to learn the names of the members of this Advisory Board who attended the meeting and made the recommendations. Anyhow, the London members of this Advisory Board had recently an opportunity of showing their interest in the British Medical Association, and that interest may to some extent be gauged by the amount of their subscriptions to the local fund for promoting the success of the London meeting. There has, perhaps, never been another annual meeting of the British Medical Association where the local subscriptions from leading members of the medical profession have been on such a niggardly scale; but for the generous allowance of £2,000 from the Association the meeting would probably have been a financial fiasco.

It need scarcely be said that the general statement here made does not apply to Mr. Butlin, because there has never been a more generous President of the British Medical Association, and we know that he has not been well and could have taken no part on the Advisory Board in selecting the date.

If this Advisory Board start an opposition to the British Medical Association, then I hope every loyal member of our Association will boycott the International Medical Congress, and when the hat goes round the provinces, as it is sure to do, be careful to take no notice of it.—I am, etc.,

September 29th. Member of the B.M.A.

STATE SICKNESS AND INVALIDITY INSURANCE.

Sir,—As one of the rank and file of general practitioners who knows nothing of the inner workings of the Association beyond what appears in the Journal, I am anxious to know what position is now to be taken in regard to the future of medical attendance. We are told that a deputation is to wait on Mr. Lloyd George, probably some time next month, in reference to the State Insurance Bill which the Government have told us they intend to introduce. Can this deputation express the mind of the profession, or even of the Association, on this subject? So far as I can see, they can only give their individual opinions, and are not entitled to speak in the name of a profession whose views have not yet been ascertained. Can they say whether the profession or the Association desire that medical attendance should be included in the State insurance bill, whether medical men wish compulsory payment to be made only by workers or by their wives and families, and what is the limit of income to which State insurance should apply?

These and other matters might well have been brought before the last meeting of Representatives. To myself the

resolutions then brought forward by the Special Poor Law Committee were most disappointing. Though a new member of that body I ventured to say then, and now repeat, that these recommendations might have been framed ten years ago, as they have almost no bearing on the present position. It is quite true that the discussion was merely academic, and no decision binding the Representatives was made. This was plainly stated in the second resolution, which reads as follows:

> That the Report and Recommendations be discussed by the Meeting, and afterwards referred to the Council for further consideration prior to reference to the Divisions, and that the Resolutions of the Meeting be forwarded for the assistance of the Council as expressions of the opinions of the Representatives present, but not as decisions of the Representative body.

The leading resolutions were presented in a form that did not appear to be generally understood, and were not discussed, and though I have puzzled myself not a little to ascertain the meaning of some of the others I have as yet failed. Did the Council send down to the Divisions the recommendations in this form it is doubtful if members would attend the meetings, or if they would ever be seriously considered. This is not as it should be. Never was there a time when issues so seriously affecting the welfare of the profession depended more on the action now taken, and this is my excuse for putting the matter so plainly and writing at some length. Every member of the Association must get to know the position in which we are now placed, and recommendations must be so formed that there can be no difficulty in giving an opinion. Can we say that this is possible if in the recommendations or questions sent down the reports of the Poor Law Commission and the Government proposals are entirely ignored? Hitherto medical men themselves have done little to solve the problem of medical attendance as it affects the working-classes. The Poor Law Commission has been spending years on this question. The Government have evidently had it under serious consideration, and if the time and energy thus expended is to be ignored, and recommendations or questions sent out which do not even refer to matters so long and earnestly discussed, I cannot but regard an action of this sort as a deliberate insult to the Government and the Poor Law Commission, the consequence of which it is not difficult to foresee. It is certainly the best possible means of playing into the hands of the friendly societies whose methods are more practical than ours.

My reason for writing is to make a humble appeal to the Council and the Poor Law Commission to give further consideration to the recommendations or questions to be sent down to the Divisions, and also to elicit, if possible, the mind of those on whom the responsibility now rests.—I am, etc,

Greenwich, Oct. 3rd. J. H. Kray.

THE ENEMY WITHIN OUR GATE.

Sir,—It is a truism that our most formidable enemies are inside the profession. How are we to deal with the type of man who, although doing never less than one hundred visits a day, as proved by the production of his visiting list to the clergy, chemists, and other good advertising media, is yet eager to undersell his opponents for any wretched little appointment which crops up? The most solemn promises have no restraining influence where the pocket is concerned. Expulsion has no terrors for a man of the type referred to. He never has "time" to attend a meeting of the Branch. The society of self-respecting practitioners produces a feeling of discomfort. Boycotting is also ineffective, as some one can always be found for the sake of "humanity" or the half fee to help this very lame dog over a stile. What is the remedy?—I am, etc.,

Falkirk, Oct. 3rd. George C. Stewart.

CONTRACT PRACTICE AND THE MEDICAL PROFESSION.

Sir,—There is a good deal of unrest in the ranks of the medical profession at the present time, due no doubt to the fact that the income of the general practitioner is getting less year by year, and to the uncertainty as to what the Government may do in the future in regard to the reports of the Royal Commission on the Poor Law.

During the last ten or twelve years the income of the general practitioner has fallen about 30 per cent. This is due to many causes, the chief being:

1. The lower death-rate, brought about almost entirely by the efforts of the medical profession, and meaning far less serious illness to attend. In Leeds twenty-five years ago the weekly death-rate was often 24 or 25 per 1,000; now it is nearly always about 12 or 14 per 1,000.

2. The lower birth-rate. The birth-rate has gone down exactly 30 per cent. in the last thirty years in Leeds. This means one-third fewer confinements for the profession to attend. The midwife has taken a much larger share of the midwifery than formerly, so that in Leeds there has been a reduction in the number of cases attended of from 30 to 60 per cent., as ascertained by actual inquiry.

3. The Notification Act is responsible for the removal of all infectious cases to the local fever hospital. As a rule a practitioner sees these cases only once, whereas formerly a prolonged attendance was necessary.

Along with diminished income there has been a great increase in the expenses incurred by medical men in the conduct of their practices. Drugs are dearer, or more costly drugs are used. The salaries of assistants and the locumtenents have nearly doubled during the last ten years. Rates and taxes are much higher. The cost of getting about is greater. Tramway facilities have undoubtedly, in the provincial towns at least, had the effect of causing the working classes to live further away from the workshop, thus affecting most medical men doing friendly society work. The cost of medical education has also increased a good deal these last few years, thus affecting those who are putting their sons into the profession.

There is now, also, a good deal more competition from hospitals and dispensaries.

The future of the profession appears to be somewhat gloomy. Apparently the Government contemplates legislation which will have the effect of still further reducing incomes, and so far as I can see we shall all take it "lying down."

In the past we have allowed public bodies, such as corporations, boards of guardians, etc., and friendly societies to sweat the profession just as they like, and we are going to allow the Government to do the same.

Dr. Bateman, in his letter in the Journal of September 24th, says:

> Surely we are sufficiently powerful to put a stop to the long continued exploitation of medical practitioners.

I am afraid we are not sufficiently well organized as to be powerful enough to do so. The British Medical Association does its best as a voluntary organization to guide legislation in a proper direction, but I fear with not much success.

To my mind, the root-cause of the disorganization, lack of interest, etc., which we find in the profession, is due to the absurd and ridiculous manner in which we are governed. It is an outrage on common sense.

Has not the time come when the General Medical Council, as at present constituted, should be done away with? As individuals and as a profession we have not the slightest power to govern ourselves, and until the profession is governed by a body of men elected on a democratic basis—a body representing the desires and aspirations of a great profession—so long shall we be exploited by any "Tom, Dick, and Harry" who comes along.

No doubt the General Medical Council filled a useful position many years ago, but there is no doubt it has long outgrown its usefulness. It is now a costly, useless machine, doing little useful work in its limited sphere, and the sooner it is swept away and replaced by a body more representative of the rank and file of the profession the better it will be.

What can be more absurd than the whole of the practitioners in England being represented by three members on the Council? One may respectfully ask, What good are they; what power do they wield? If we had a council elected by the profession, and thoroughly representative, at this important crisis in our affairs, it would wield a great influence, and no doubt guide legislation in a legitimate direction.

The General Medical Council is composed of men representing only the interests of the various instructing and

examining bodies—men who have no more knowledge of the trials and difficulties of the general practitioner than a board of guardians. The Privy Council elects five representatives. Why it should have this power I really cannot see, and it would be instructive to know who directs the Privy Council when it is electing.

In the sister profession of the law the General Council of the Bar is elected by the votes of the barristers—so many of the Inner Bar, so many of the Outer Bar, of which a certain number must be of less than seven years' standing. Why should not the medical profession have the same right of election, and so be allowed to manage its own affairs?

I do not think it would be very difficult to bring about this desirable change if the profession showed an earnest desire for alteration. A strong committee of the British Medical Association could do a good deal by securing pledges from every Parliamentary candidate throughout the country in favour of a reform of this kind.

A resolution, if the standing orders permitted, should be moved at a meeting of the General Medical Council by one of the direct Representatives calling for legislation on the lines indicated in this letter, and I feel sure it would meet with support from some of the members. If the Government saw that the profession was united in a demand for reform, I am quite sure it would be possible to get an Act passed sooner or later. I think the Association should at once take this question up, formulate a bill which would deal adequately with the whole question, secure the help of those medical men now in Parliament, then keep pounding away until success is achieved.

In conclusion, I am quite sure we shall never have a "united profession," or speak with "no uncertain voice," as Dr. Bateman puts it, until we as a profession have the control of our own affairs, instead of being in the hands of an unelected oligarchy.—I am, etc.,

Leeds, Oct. 3rd. ARTHUR HAWKYARD, M.D.

SANATORIUM TREATMENT OF TUBERCULOSIS

SIR,—There are, I think, certain statements made in Dr. Dutton's letter appearing in your issue of September 24th which should not go unanswered. May I therefore, as a former sanatorium doctor, be allowed to speak on behalf of the class of sanatorium doctors as a whole?

In the first place Dr. Dutton asks, "Does Dr. Collier, or the advocates of this treatment, sleep in the cold, damp air themselves? Now, Sir, I was for some time Resident Physician at the Royal Victoria Hospital for Consumption, Edinburgh, and for the whole twelve months of my stay there I slept outside in the grounds, doing so of my own accord, in all weathers, in preference to sleeping in a bedroom, though one was provided for my use in the hospital building itself. I can only say—and those who have had any experience of sleeping out will not need to be told—that I derived infinite benefit *and* enjoyment from so doing. Further, Sir, I was told that every resident who had been there before me had done the same thing.

Before commencing work in London I made a tour of inspection of most of the working-class sanatoriums in the southern and eastern counties to which patients are sent from London—visiting, amongst others, Frimley, Ventnor, Bournemouth, Benenden, Kelling, Coppin's Green, Maltings Farm, and Maitland Cottage—and without exception I found that the doctors in charge of these sanatoriums themselves carried out the open-air treatment.

This should, I think, be a sufficient answer to the above question, as to what the doctors who advocate this treatment do themselves.

But Dr. Dutton goes on to say: "Why, therefore, torture these poor unfortunate victims by exposing them day and night to cold damp air, which renders (in my opinion) their breathing more difficult and their cough more distressing."

Now, Sir, the unvarying experience at the Victoria Hospital in Edinburgh was that the patients considered it a promotion to be moved out of the wards (themselves as open to the four winds of heaven as an architect can make them) to the shelters in the grounds, and clamoured for the privilege of being allowed to sleep out of doors. These same patients, Sir, would laugh louder than anybody were the word "*torture*" but mentioned. In the course of my work in London I have in several cases induced working-class patients to sleep out of doors—in their gardens or back yards, on flat roofs, or on leads outside their windows—and for this purpose my committee have provided them with simple open-air shelters. Without exception, Sir, though the conditions of a London back yard are far from perfect, these patients are enthusiastic as to the pleasure and benefit derived. Some weeks ago Professor Howard Marsh, of Cambridge, wrote and asked my permission to see a shelter in use. I was away at the time, but he was taken to see one in the Queen's Park district. He was so much impressed by what the patient told him concerning the advantage of sleeping out of doors that, in writing to me later, he declared that he would have liked to have taken down in shorthand and published the whole of the conversation which took place.

From such experience, Sir, I can draw but one conclusion, and that is that Dr. Dutton's letter was absolutely unjustified.—I am, etc.,

D. J. WILLIAMSON.

Paddington and Kensington Dispensary for the Prevention of Consumption, London, W., Sept. 27th.

THE TREATMENT OF PULMONARY TUBERCULOSIS.

SIR,—In reply to the invitation of Dr. Lees (BRITISH MEDICAL JOURNAL, September 17th, p. 822), I regret it is impossible for me, owing to the loss of my record of cases, to publish anything like a complete list of patients suffering from pulmonary tuberculosis and successfully treated by continuous inhalation.

The combination of antiseptics used varied according to the nature and idiosyncrasy of each individual case, but, generally speaking, guaiacol, carbolic acid, and spirits of chloroform formed the principal ingredients, oil of turpentine being added when any haemorrhagic tendency existed. I quite agree with Dr. Lees that failure in the past by this form of treatment has been largely due to inefficiency in carrying it out. To be successful the inhalation must be continuous for not less than twenty-two hours daily, the only intervals allowed being during meals, and during the first fortnight the patient should be rigorously confined to bed.

The period of repose is to be regulated entirely by the temperature; if any considerable evening rise persists it will be necessary to prolong the patient's stay in bed, and, on the other hand, when the temperature approaches the normal graduated exercises are recommended, and the inhalation is suspended at regular intervals during the day.

I think my own case may be cited as a fair example of the efficacy of this form of treatment. Twelve years ago I was seen by five physicians of eminence, and all agreed that I had pulmonary tuberculosis, the bases of both lungs being affected. The usual classic symptoms were pronounced, and the bacilli were present in the sputum.

I believe at that period the bacilli inspired more dread than they probably do at the present time, and that a gloomy prognosis was frequently founded simply on account of their existence in the sputum. However, a residence abroad of some months was prescribed, and faithfully carried out, but on my return to England my condition was worse in every respect. I then determined on my own initiative to continuously inhale a combination of creosote, carbolic acid, and tincture of iodine, using ten drops every two hours in a Yeo's inhaler. For the first fortnight the inhalation was almost continuous during the twenty-four hours. At the end of the first week there was a marked improvement in all the symptoms, and at the end of the fifth week the cough had subsided, the expectoration had ceased, the temperature, which was always over 101° F. in the evening, had fallen to normal. Since then there has been no return whatever of any of the symptoms—an example of the efficacy and permanency of the results obtained entirely by *continuous inhalation*.

My most recent case was a gentleman, aged 54, occupying a high position in the Indian Civil Service. He had been treated in India for malaria and typhoid fever, and was about to be operated on for supposed liver abscess, when one of the physicians present examined the chest and found a consolidated patch at the base of the left lung and another in the second (left) intercostal space. The patient was losing flesh and had suffered from fever of obscure origin for eleven weeks previously. He was ordered home immediately, and on arrival here, on

March 7th, consulted me. The diagnosis was easily confirmed, and the condition of the patient appeared to be very serious. He lost 23 lb. in weight. The cough was very distressing, especially during the night, and the expectoration abundant. There was a daily rise of temperature to 101.5° F., usually between 4 and 6 p.m. The voice was husky and there was considerable tumefaction of the epiglottis and arytenoid regions.

Treatment was commenced immediately. The patient was confined to bed for ten days in his hotel, and continuous inhalation of a mixture containing guaiacol, carbolic acid, tincture of iodine, and spirits of chloroform was ordered, and faithfully carried out. At the end of that period there was marked relief from all the symptoms, and the patient was sent to a district outside Cairo. Here he was confined to his room, but not to bed, for another week as the temperature still remained high, but the inhalation was continued, the only intervals allowed being during meals.

At the end of the third week the cough had completely disappeared, as well as, of course, the expectoration. The temperature was normal for the first time for fourteen weeks, and remained so until his departure three weeks later. The weight increased by 11 lb, and careful physical examination of the chest revealed nothing abnormal. As the voice continued somewhat husky the patient was ordered to Salso Maggiore, and, although I have not heard from him recently, I have every reason to consider that his condition continues very satisfactory.

In conclusion, I wish to emphasize the fact that I have no wish to claim any originality with respect to this form of treatment, and it will be easily admitted by any one who has read the remarkable series of cases published by Dr. Lees in the BRITISH MEDICAL JOURNAL of December 11th, 1909, that the credit of having brought it prominently before the profession is entirely due to him.—I am, etc.,

Cairo, Sept. 25th. T. GERALD GARRY, M.D., M.A.O.

SECONDARY INFECTION IN PHTHISIS.

SIR,—I am much obliged to Dr. George Willett for his advice to me contained in his letter in your issue of October 1st.

Andrews, Gordon, Meakin, and Pottinger may be correct and myself wrong. Results are the point, however, and up to the present I have been most satisfied with the results of my own method—namely, the giving of a polyvalent serum for that organism in the sputum which is found to be in the majority, excluding the tubercle bacilli, as I hold that the disease the latter causes tends to get well of itself, if mixed infection is absent and the patient living under good hygienic conditions. When my results cease to be good, then will I assuredly follow Dr. Willett's advice with pleasure.

I have been much gratified with the letters I have received from all parts of the British Isles concerning my method and theory.—I am, etc.,

Yelverton, Oct. 2nd. J. PENN MILTON.

THE PREVENTION OR ABORTION OF CATARRH.

SIR,—If Dr. Hardman will persuade his patients to reduce their daily diet from 2 lb. or upwards of solid food—a common allowance—to 12 oz, he will find the prophylactic and treatment he sighs after. This quantity should be taken in two meals, and only liquids at other times, but milk must be reckoned as one third solid. Much could be said on mastication, kinds of food, and other considerations, but quantity is the important point. Under this régime the patient may catch cold, but with ordinary care the effect will pass away harmlessly in a day or two. Not only do catarrhs and influenzas yield to it, but a vast variety of maladies, such as bronchitis, asthma, and piles. The subject of catarrh is treated from this point of view by Dr. Rabagliati in *Conversations with Women* (William Byles and Sons, Bradford, 1910), p 240, and by writers in the BRITISH MEDICAL JOURNAL and elsewhere.—I am, etc,

PHILIP MIALL,
Consulting Surgeon to the Bradford Infirmary.

September 28th.

LONDON UNIVERSITY AND DEGREES IN DENTAL SURGERY.

SIR,—May I endorse the suggestion in last week's JOURNAL that now the London M.S. is open to dentists it shall also be open to various surgical branches—gynaecological, ophthalmic, etc, just as the M.D. is to medical branches. A far larger number of men would take it, as considering the now large fee, many men cannot afford to trifle with it until they are some way on as specialists, and their general surgery is somewhat rusty. From the numbers taking the gynaecological, pathological, etc., branches of the M D., one can see what a want the division of that examination has met.—I am, etc.,

October 3rd. H. B. H, M.D., B.S.

THE USES AND DANGERS OF TEETH AND PROSTHETIC APPLIANCES.

SIR,—Mr. Turner's sweeping condemnation of certain teeth, and apparently all prosthetic appliances, is so startling that one feels it should not pass unchallenged, though one would prefer the task to have been undertaken by more worthy hands. After reading Mr. Turner's letter almost every dentist would reach the conclusion that he considers the major portion of the time spent in dental education to have been wasted; and that if he is able to extract teeth, and perhaps do a few simple operations, he is fully equipped to serve the public in the best possible manner: a truly extraordinary position to take up.

In the letter under discussion are many points with which the dental profession is in accord, but there are many others upon which one is left to comment.

It is well known that edentulous persons are able to carry on the function of alimentation with success, but one also finds these same individuals ready to use artificial substitutes when the opportunity arises, and it is equally well known that it is not for aesthetic reasons alone, for the health is improved by the ability to take food which requires mastication as well as by removal of septic teeth.

Mr. Turner's attention was drawn to this subject by an aged and edentulous relative eating pork crackling. He does not say how long this individual had been edentulous or how well the crackling was comminuted by those edentulous jaws. It is a clinical fact that old edentulous persons maintain metabolic equilibrium with little or no difficulty, but young individuals in the same condition do not, as a rule, succeed so well; and these latter would, in later life, undoubtedly have much difficulty in manipulating pork crackling (unless prepared in small pieces ready to swallow), because the relative sizes of the upper and lower jaws change as the alveolus is lost, so that the lower is on a curve much external to the upper, and so it must be with other food, unless taken into the mouth in a condition ready, except for insalivation, for swallowing.

The statement that "at any period and in any class of life, once the mouth has become septic it is very difficult to regain and maintain even the state of unstable asepsis which we accept as clean" may be true, but the fact remains that it *can* be done, and *is* done, in the routine of everyday practice. This fact is apt to be overlooked whilst reading Mr. Turner's letter. One does not say that it is done in every case, but in more than sufficient to justify the treatment necessary to maintain the unstable asepsis suggested by Mr. Turner. One agrees that in hospital practice, as conducted at the present time, it is impossible to maintain this unstable asepsis to any degree; but is that any reason why the high standard of conservative dentistry of to-day shall be lowered? It has been pointed out that nutrition with mastication by artificial substitutes is better than nutrition in an edentulous person; how much more important is the power of mastication in patients who attend hospitals than in those who belong to the wealthy classes, who can pick and choose their food and its mode of preparation, needs no argument. Suffice it to say that the former supply the larger number of units to the army and navy, for which surely the standard of dental efficiency is low enough, and yet Mr. Turner would have it believed that if it were still lower there need be no fears for nutrition. Mr. Turner mentions in his paper that he has been endeavouring to settle how many opposing teeth may reasonably be considered as affording sufficient tooth mastication power; somewhat paradoxical in view of the later statement.

Because this unstable asepsis is not possible of attainment in hospitals is no argument that it is impossible of attainment, and once attained it must be maintained by means of treatment whenever necessary. "As for cases which have been pronounced clean and are hotbeds of

asepsis," one can only assume the person making such a statement is guilty of gross carelessness in his examination, for pockets, though unsuspected, can be found.

Because all the dentists in the kingdom would be insufficient to cope with the conservative and prosthetic needs of the poor is rather an argument that steps be taken to secure sufficient and competent dentists to do this work. Of its necessity there can be no doubt. One recognizes that Mr. Turner is advocating for the present, but the trend of his remarks leads one to assume that there is no solution of the problem except in an edentulous race—a condition which one doubts whether he could look upon with equanimity.

In the latter half of the letter the abuse of prosthetic appliances is discussed. It is not difficult to absolutely sterilize a tooth plate, and if necessary the dentist should instruct the patient to do this as well as clean it in the usual manner; there is no need to construct a tooth plate so that it is uncleansable—if it is so then only the dentist is to blame. Decay of teeth and an inflamed mucous membrane are both preventable, except, perhaps, in a very small percentage of cases, so that one would say that these sequelae are the exceptions rather than the rule, as Mr. Turner seems to suggest. The next point refers to the join with the root in the cases of crowns; collar crowns can be made so that there is no overlap if the root is correctly prepared and the collar properly made, the surface of root and crown being so near one (being one to all intents and purposes) that no damage accrues to the soft tissues. This join should be $\frac{1}{32}$ in. to $\frac{1}{16}$ in. below the gum margin. The anatomy of the teeth precludes one from making a satisfactory crown with the join remote from the gum, and, apart from this consideration, were such a course possible, other conservative treatment is available whereby such a tooth could be made a healthy functioning organ. Flush end-to-end joins can certainly be made, for one has an impression of the root, and the operation may be completed outside the mouth. One agrees that receding angles and concave surfaces in certain directions (under which category all inaccessible parts are included) must be avoided—they can and are avoided. Because practically all crowns and bridges Mr. Turner has seen "have been the merest travesties of these principles of asepsis" is not a reason why they should be condemned; one much regrets that he should not have had the fortune to come across good examples of such work as he condemns almost unreservedly; condemn, if he will, the men who overlook the necessity and feasibility of cleanliness, but not crowns, bridges and prosthetic appliances in general, which with the natural teeth can all be maintained in a satisfactory and clean condition with reasonable care.

In conclusion, it appears that Mr. Turner has argued from the exception rather than the rule throughout; individuals need have no fears for their nutrition if edentulous just as one may survive without four limbs, but many will have a happier existence if not edentulous; there are many cases in which it is quite unnecessary from the point of view of sepsis, *per se*, for these individuals to become edentulous and if such a condition does arise, whether total or partial, it also is unnecessary from the point of view of sepsis, *per se*, for the individual to remain so, for artificial substitutes can be adjusted which, as well as any remaining natural teeth, are capable of being kept perfectly clean and healthy with reasonable care, the result being a nation more efficient and more pleasant to behold. Has not the position Mr. Turner assails arisen through the failure of the dentist to carry out those principles which it is his duty to be fully acquainted with and to teach his patients, and not to any inherent defect in prosthetic work in general? We live in an age in which teeth are demanded—natural ones must be retained where possible, and artificial ones substituted where necessary; these facts have to be confronted and need cause no alarm; they can be complied with and with advantage to the individual and with few, if any, disadvantages, not one of which need be sepsis. The fault lies in the paucity of the dental profession and the slowness with which its numbers are being increased, as well as in the fact that more advanced clinical instructions is needed for those who are willing to undertake the more difficult types of dental work.—I am, etc.,

London, W., Oct. 5th. HAROLD CHAPMAN.

THE HEARING AFTER OTECTOMY.

SIR,—Every few years a note appears in the JOURNAL from Mr. Faulder White advocating in cases of chronic middle-ear suppuration a resort to what he terms *his* operation of "otectomy," and deploring "the vogue of the radical mastoid operation." As a voice crying in the wilderness, Mr. White's piteous appeal appears to fall on deaf ears; no one often takes the trouble either to controvert or endorse either his claims or his criticisms of current practice. The reason of this is not far to seek. Mr. White is a very loose writer who uses an eccentric terminology, and does not present his thesis before us in such a way as to command serious consideration. When Mr. White writes of "my operation of otectomy" it might be inferred by any one knowing nothing of his methods that he could claim to have brought forward and practised some original operation, or, at all events, to have modified by marked improvements in technique some previous form of operation. The term "otectomy" might suggest the former to be the case, for this word literally means excision of the auditory apparatus. So far, however, from Mr. White in fact advocating any so formidable an operation, he really only wishes to call attention to the value of various minor operative procedures performed on the tympanum by way of the meatus. These permeatal procedures Mr. White characteristically designates "intrameatal." "My operation of otectomy" (*sic*—singular) turns out then to mean quite a number of diminutive otectomies. And as a matter of fact Mr. White as far as I can gather from his writings, cannot claim to have originated any new operative procedure whatever, whether in the surgery of the meatus or in the permeatal surgery of the tympanum. Aural surgeons have been performing for many decades most of these various operations in and through the meatus which Mr. White alludes to under the very comprehensive term "otectomy." There is, however, a difference in the practice of individual surgeons in the frequency with which they resort to a certain type of permeatal operation—namely, ossiculectomy, with or without atticotomy. Many aural surgeons perform this operation only very rarely; others, like myself, resort to it with more frequency, but not very frequently, and not in any way as a more or less routine procedure, whereas I think "routine" correctly describes the practice of Mr. White. Although it is true Mr. White sometimes includes under the term "otectomy" a number of minor operations on the tympanum and meatus which we have many of us done in thousands, we may be sure that when he alludes to his "500 otectomies" he is using the term in a narrower sense, meaning some form of permeatal tympanic exenteration, an operation often spoken of for short as "ossiculectomy," and which has in the opinion of most otologists a comparatively restricted field of usefulness. The confusion caused by the use of the term "otectomy" may best be illustrated by a quotation from Mr. White's monograph, entitled "Infected Ears" (p. 99) ". . . the removal of an ossicle is not an essential step in an intrameatal (*sic*) operation; for the cure of otorrhoea I prefer to use the term 'otectomy' which signifies a cutting out from the ear, and, as every case should be treated on its merits, in one case all that may be required is a curetting of a carious patch, in another perhaps the removal of the outer attic wall."

To say that permeatal surgery is neglected in this or any country is inaccurate, and if on the other hand Mr. White really means to suggest, as I believe he does, that a more or less routine resort to permeatal tympanic exenteration in chronic middle-ear suppuration would reduce the necessity for more radical post-auricular measures to a minimum I can only say that it is contrary to first-rate experience at home and abroad.

In opening a discussion in the Otological Section of the British Medical Association at Exeter in 1907, I as clearly as I could in the short time at my disposal advocated permeatal tympanic exenteration (ossiculectomy, etc.) in certain conditions occasionally met with, so that I am not an out-and-out opponent of these operations, but actually perform them in some carefully-selected cases with more or less success. Experience, however teaches me that in the larger number of cases seriously demanding operative interference either "complete radical" or "mitigated radical" operations have a much wider field of usefulness.

I suggest that it would be more convincing in speaking of percentages if Mr. White would give us a really adequate presentation of, say, his last 100 cases in which he performed a permeatal tympanic exenteration where he believes most otologists would have resorted to more radical post-auricular operations. Let him state his case before the Otological Section of the Royal Society of Medicine if he still thinks he has a case.

Mr. Hunter Tod's able communication to the *Lancet* (September 3rd, 1910), recording the results in fifty cases in which this type of operation was performed, is a model of clear exposition and accurate observation which any one might with advantage endeavour to imitate.

Mr. White's claims and his uncomplimentary references to the methods of leading aural surgeons might safely be ignored by me as by others, and I should not have troubled to challenge his contentions did I not recognize that Mr. White, however uninformed, is thoroughly in earnest and sincere in this matter.—I am, etc.,

London, W., Oct. 4th. WILLIAM HILL.

SIR,—I was much interested in Mr. Faulder White's letter in your issue of October 1st anent the beneficent results of otectomy. There are no doubt many cases of chronic aural suppuration with antral empyema, simple or coupled with a mild degree of bone disease, where patients might be spared the radical mastoid operation. Of course, every case should be dealt with on its merits. The minor operation would need to be vigorously tabooed in the presence of the slightest evidence of intracranial complication, active mastoiditis, extensive bony involvement, labyrinthine suppuration, tuberculosis, facial paralysis, etc., but there is in my experience a very large class of cases where chronic aural suppuration has its origin in, and is maintained by, antral empyema, diseased attic and ossicles, in which a complete clearance of the aditus, attic, and tympanum, followed by antiseptic treatment, yields the most gratifying results in every respect.—I am, etc.,

London, S.W., Sept. 29th. CLAYTON FOX.

THE MEDICAL SICKNESS SOCIETY.

SIR,—In a letter which appeared in the BRITISH MEDICAL JOURNAL of July 2nd last, Dr. E. D. Kirby asked for information about the rate of interest earned by the funds of the Medical Sickness and Accident Society and the average age of the members.

The rate of interest earned by our funds is £3 8s. 0d. per cent. per annum and has not appreciably varied for some years past. As we are compelled by the provisions of the Friendly Societies Act, and also by our own rules, to invest only in first-class securities, I do not think this rate can be increased.

The average age of the members was in 1898, 41 years 6 months; in 1903 it had risen to 42 years 1 month and in 1908 to 44 years 11 months, but many of our members are approaching the age of 65 years, on which, by our rules, they go out of sickness benefit, whilst those who join as new members are, for the most part, less than half that age. It is doubtful, therefore, whether the average age will rise much further.—I am, etc.,

F. ADDISCOTT,

London, W.C., Sept. 30th. Secretary, Medical Sickness Society.

SPIRITUAL HEALING AND THE "GUILD OF HEALTH."

SIR,—However much Mr. Boyd may question the taste of the first paragraph of my former letter, I venture to think that his communication of September 24th fully justifies the statement to which he objects. In nearly a column of words in your issue of October 1st there is nothing tangible or really helpful to be found.

Mr. Boyd begins by asserting that he did not act "independently of medical control" in the case of myasthenia gravis, because, forsooth, he asked a medical friend about a disease the name of which he had obtained from a patient who stated that she was no longer under the care of any doctor. Does Mr. Boyd really think that such tortuous argument justifies him in undertaking treatment? Does he really consider that there is much difference between a society that "aims at forwarding a revival of spiritual healing," and one that exists to "put you in the way to obtain spiritual healing?" Is it decent to retort to a request for a definition of proposals of his own making that I am as unable as himself to define the limits of spiritual healing?

I hardly like to suggest that Mr. Boyd is making use of this correspondence as an advertisement for his methods, but I am sure that until he repents, deals honestly with himself, and attempts to use his reason, neither the Guild of Health nor its warden will succeed in awakening the interest or enlisting the sympathy of thinking men.—I am, etc.,

London, W., Oct. 2nd. CHARLES BUTTAR.

SIR,—I am content to refer your readers to the whole correspondence, which has followed my article published under this heading on August 20th; and to assert confidently that the Warden's letters have only made it clearer that we should not co-operate with this Guild.

I think the normal clergyman will share the regret that our common earnest desire for greater union should be handicapped by certain of their number attempting to "revive" so-called spiritual healing by the methods that I have criticized.

To give one more instance of these methods: my sister having written as a stranger to the secretary for some of the society's publications, received also their printed memorandum in which we find this statement: "We do not as a Guild supply healers, though we are ready to give any information we can about those who are engaged in that work." Here is the unqualified use of the word "healer," and a definite open offer to recommend my sister to a healer, whether he might be the warden or some clerical colleague; and I hold that it is most undignified for ministers of religion to use such a society in order to bring any stray patient, who may happen to hear of this guild, to them for healing.

I am speaking plainly, as this guild, according to its last report, had 53 clergymen, with 351 ladies, but no members of our profession, amongst its 429 members; and although certain clergymen have boomed Mr. Hickson and other lay healers, hitherto none have openly placed themselves at the head of such a society as this.

The last letter from Mr. Boyd offers most significant agreement with the statement of the Organizing Secretary who wrote to a lady inquirer: "We don't consider any disease, however incurable it seems to be, beyond the reach of spiritual healing." For Mr. Boyd never hesitated as to whether the case of myasthenia gravis was suitable for his treatment, but was satisfied that he was well qualified to treat it because he says: "I consulted a medical friend of mine who told me all that is, I believe, known about the disease"!

Further discussion of this guild would not serve any useful purpose, as obviously only the intervention of the bishops can check this bad precedent set by some of their clergy.—I am, etc.,

London, W., Oct. 3rd. STANLEY BOUSFIELD.

*** We think that further discussion of the aims and methods of the "Guild of Health" would be unprofitable.

"SPIRITUAL HEALING."

SIR,—The Rev. F. Boyd says in your last issue that he cannot accept my limit of hysteria I placed no limit to hysteria, but only to his ability to "heal."

Faith may remove mountains, but hysteria can remove continents!

His remarks about organic and functional disease I do not understand, but "the highest medical authority," whatever that may mean, will hardly assist his position.

The difference between organic and functional disease he, at least, is quite unable to distinguish, nor is he, as a clergyman, expected to be able to do so. Could he do so, it is time he changed his occupation. As for the proposal to act "in co-operation with some one who is qualified," that is absurd, as no medical man may cover an unqualified person.

The correct correspondence between "subjective" and "objective" phenomena is hardly to be expected from many, and the clergyman least of all; this disability is by no means derogatory to "the cloth."

The province of the clergyman is to minister to the spiritual needs of his flock when so needed, to help them to bear pain when such may be their sad fortune, to help them not to exaggerate their symptoms by undue subjectivity, and to "heal" them spiritually of spiritual ills if

he can do so; but by his methods or by his results never to mislead them to believe he has done more than the duty of a clergyman—a profession the following of which entails no time or inclination for the indulgence in quackery.—I am, etc.,

October 3rd. J. W. T.

SYCOSIS: SO-CALLED "BARBER'S RASH."

SIR,—I have read with great interest the series of experiments made by Dr. Wishart, but I am unable to agree that they absolve the barber from blame in many cases of sycosis.

To my mind, neither the lathering nor the use of the razor—except as accessories before the fact—play any great part in the conveying of infection from one customer to another, but it is the sponge used when the shaving has been completed and the skin more or less abraded which carries the infective matter.

Sufficient care is frequently not taken in disinfecting the sponge; sometimes after having been used it is carelessly thrown into the basin, where it may remain until, after a casual rinse, it is used on the next customer. If the customer should prefer a cold sponging, the sponge is merely held under the cold tap for a few seconds, and any infective matter upon it loses little of its power.

I am aware that the higher class hairdressers are more careful, as a rule, but until all hairdressers are compelled to pay more attention to the sponge cases of sycosis will continue to be laid to their doors.—I am, etc.,

Great Malvern, Sept. 6th. J. N. F. FERGUSSON, M.B.

HOW TO USE THE "JOURNAL."

SIR,—The letters you publish from Drs. Carey Coombs and C. O. Hawthorne describing how they use the JOURNAL induce me to mention my plan. I have found the "Athenaeum News Cutting Album" (bound in green cloth and costing 3s. 6d.) most convenient for keeping those parts of the JOURNAL that I want for reference. The album contains fifty stout numbered leaves, gummed on each side and interleaved with waxed paper to prevent adhesion. The leaves are the same size as those of the JOURNAL. Those pages of the JOURNAL that I want to keep are cut out, the gummed surface of the leaf is moistened, and the pages at once stuck in the book. Either whole pages or parts of single columns are arranged with equal ease, and, as five whole pages can be stuck to one gummed leaf surface, the book will hold a large number of cuttings. The title of the article and the number of the page on which it occurs are written in the alphabetical index provided, and a tidy, handy, bound book of reference is at once formed.—I am, etc.,

Horsham, Oct. 1st. A. J. FAIRLIE-CLARKE.

INTRACELLULAR SALINE INJECTIONS.

SIR,—I have read with much interest the article on a simple curative treatment of cholera, by Professor Leonard Rogers, a work that is classical.

I do not, however, here intend speaking of cholera, of which I have had no experience, but I would plead for a more general use of saline injection, not intravenous but intracellular.

Numbers of lives are lost for the lack of this treatment. *Post-partum* haemorrhage, change of life, loss of blood from injury, etc., how many of these cases might have been saved by this treatment, lives in all cases valuable, if not to the public, to someone?—I am, etc.,

Paignton, Sept. 28th. GRIFFITH C. WILKIN.

THE AIR INSIDE A MOSQUITO NET.

SIR,—In his interesting paper on the effect of a mosquito net on the air within it, published in the last issue of the JOURNAL (p. 972), Dr. Duncan Whyte makes a comparison between the organic impurity in the air within a mosquito net and that in a polluted water. He says:

> If water from a well were found to contain as much oxydizable organic matter as the specimens of distilled water that had been shaken up with the air inside the net, and if no further tests were possible, the well would assuredly be condemned as "unfit for drinking purposes"; but the individual sleeping within the mosquito net has been inspiring this impure air for the last few hours of his sleep.

So far as I know, there is no evidence to show that the organic matter in water *as such* is deleterious; its importance is what it indicates—namely, the probable presence of undesirable micro organisms. I venture to think that Dr. Duncan Whyte's analogy is a false one. At the same time I do not suggest that such organic impurity in the air is of no moment. I would agree with him that it is highly undesirable, and that adequate ventilation of the mosquito net should be ensured.—I am, etc,

King's College, W.C., Oct. 1st. R. TANNER HEWLETT.

Universities and Colleges.

UNIVERSITY OF LONDON.

PROFESSOR E. A. MINCHIN, Professor of Protozoology in the University, will give a general course of about twenty lectures on the protozoa, at the Lister Institute of Preventive Medicine, at 5 p.m. on Mondays, Wednesdays, and Fridays during the second term (January to March). The lectures are free, and will be addressed to Honours B.Sc. students and to medical men, and will be followed by exhibits of preparations as occasion requires.

The Services.

LOWLAND DIVISION, R.A.M.C., TERRITORIAL FORCE.

MAJOR-GENERAL SPENS, C.B., commanding the Lowland Division of the Scottish Command, has issued his official report on the annual training of the territorial troops under his command during 1910. With regard to the annual training in camp of the Royal Army Medical Corps he says it "was thorough, practical, and well carried out. Those sections of the field ambulances that attended manœuvres in Haddington and Fife marched and carried out their duties very well indeed. Officers gained experience as to the principles of employment of a field ambulance by these manœuvres, and it is hoped in the coming year they will increase their knowledge by means of regimental exercises."

VOLUNTARY AID DETACHMENTS.

AT the annual meeting of the council of the County Territorial Associations of Scotland held in Glasgow on 28th September, Sir George T. Beatson, M.D., K.C.B., gave an address on the formation of voluntary aid detachments in connexion with the Scottish Territorial Red Cross Brigade, and the work of the British Red Cross Society.

Medico-Legal.

CHRISTIAN SCIENCE TREATMENT.

AN inquest was held at Urmston by Mr. J. F. Price, Manchester County Coroner, on September 29th, into the death of Mr. Walter Statham, aged 53, described as an adherent of the Christian Science Church. Mr. Statham's son, in his evidence, said that up to seven years ago his father had generally good health. Then he broke down with nerve trouble, and about three years ago his left leg became lame. He never sought medical advice until May 10th of this year. In the interval the leg grew worse, and Dr. Clegg was called in. The doctor advised him to see a specialist, and on the same day Mr. Statham went to Manchester, and saw Dr. Burgess, who told him to lie up. Dr. Burgess also said the leg would probably have to be amputated. For a fortnight Mr. Statham was under the care of Dr. Clegg, who advised him to have the leg amputated, saying if the operation was not carried out the limb would probably waste away. Witness said his father refused to have the leg amputated and gave two reasons, the first being that he always had a horror of amputations, thinking them unnecessary, and the second reason was that he was a Christian Scientist. The witness went on to say that his father commenced Christian Science treatment, and on May 25th he sent for Mr. Pitfield, a Christian Science practitioner. In reply to the coroner he said Christian Science treatment consisted of reading Scriptures and Christian Science books and prayer. The treatment took place, perhaps, two or three times a week. There was no actual treatment of the leg, which was only bathed by Mrs. Statham. The patient never showed any sign of improvement, and death took place on September 25th. Payments were made, but witness did not know what they were. He proceeded to say that Mr. Pitfield saw his father very often, and the latter seemed to be thoroughly satisfied with the treatment. His father had great faith in Christian Science and was quite convinced, at any rate until a few days before his death, that there was always a hope of recovery. Asked if he was in any way coerced into the matter, the witness said his father sent for Mr. Pitfield, and it was distinctly understood by all of them that any treatment he underwent from the Christian Science was entirely at his own responsibility, and the responsibility for not taking the doctor's advice

entirely rested with him. His father was in much pain at times. Nothing was done to relieve him but prayer and what Mrs. Statham could do.

Dr. Clegg, who then gave evidence, said he went to see Mr. Statham on May 14th, and found him suffering from a tuberculous disease of the left knee, and after Mr. Statham had seen Dr. Burgess both the specialist and witness advised the patient to have the leg amputated. He took a day to consider the matter, and then decided not to have it done. The witness said it was clearly pointed out to the patient by himself and Dr. Burgess that if he did not have the leg amputated it would inevitably wither away and kill him. The doctor went on to say that he attended Mr. Statham for two or three days and then was told not to come again as Mr. Statham was about to undergo Christian Science treatment. Witness saw him a few times afterwards, but never discussed the disease with him. When told that it would end in death he said he had great faith in the treatment he was about to undergo. As a matter of fact, from time to time he said he thought he was improving—even up to a few days before he died. The doctor considered that death was caused by septic poisoning through absorption from the diseased knee joint. It was the same practically as consumption in the lungs. In reply to the coroner, the witness said that if the patient had had his leg amputated it would certainly have prolonged his life, though the leg had got very bad. At that time it was a local condition. The system was only affected eventually.

William Pitfield, a Christian Science practitioner, of Brockhurst, West Didsbury, said he went to see Mr. Statham on May 25th, and was told the doctors had advised amputation of the limb. He was told they had said that was the only hope. Asked by the Coroner if he and the patient did not believe this, the witness said it was no business of his to advise him what to do, but Mr. Statham decided not to have it done. The witness attended him up to September 24th, and the treatment consisted of prayer, the reading of Scriptures, and the Christian Science textbook, *Science and Health*. No treatment was given to the leg, but he showed no improvement, though he said once or twice that he felt he was better. He had no faith whatever in medical science, but he had the greatest respect for the doctor.

We give the rest of the proceedings as they are reported in the *Manchester Evening News* of September 29th:

The Coroner: Did you expect Mr. Statham to recover without any treatment whatever?—I do not consider that prayer to God is "without treatment."

The Coroner: I mean actual local treatment?—I consider prayer to God is local as well as general treatment.

And then to what do you attribute your treatment?—I cannot say it has been a failure.

The Coroner (emphatically): It has been an absolute failure.

Mr. Pitfield: The case has not been "met."

Mr. Price: I ask again is it success or failure?—The man has not been healed.

I take it, then, it has been failure?—I am dealing with it spiritually. The case has not been "met."

Then, if it has not been successfully treated, it has been a failure?—Yes.

Do you attribute that to a want of faith in the deceased himself?—No, I would not say that.

Do you agree with medical men that they have been given the powers from the Almighty to effect cures?—I say that their treatment is not science.

Where do you say, then, their gift comes from, God or the devil?—I can't say.

Do you say that they have no knowledge?—I say it is not science; they practise according to their own light.

The Coroner: I was taught that God helps them who help themselves. If this man had had his leg amputated he would have probably been living to-day. Quite apart from your prayers, would you think he had faith?—I would rather not argue the point.

The Coroner (warmly): You cannot argue it. Do you ever have children?—I have had.

The Coroner: I would advise you to drop it in future, because if you do not you may probably find yourself in the dock.

Witness: I would obey the law.

The Coroner: Yes, and leave it to the doctors. I certainly "would" advise you to obey the law. Why obey the law if you have faith in your own treatment? It only shows the shallowness of the whole thing. You dare not do it in the case of children.

The Coroner added that this man, if he had been foolish enough not to take the advice of the doctors' powers, which he suggested God had given to them, he took the risk. He was an adult and could choose what he liked.

In reply to a juror, Mr. Pitfield said he had practised Christian Science for four years. He had passed no examination nor held any diploma.

The Foreman asked what witnesses he had to bring to prove that his powers were successful?—You can hear testimonies of people who have been healed of all diseases.

You have juggled with this man's life. How can you cure a man suffering from a compound fracture?

Witness simply said they did not juggle.

Another Juror: You said there was no hope at the finish?—I said I saw the case was not being met.

The Coroner observed that if that had happened in the case of a child the witness would in all probability have been sent for manslaughter.

The witness further said that at the end he suggested sending for a doctor.

A Juror: And if he had died because of the amputation you would have put it down to the doctor.

Other jurors strongly commented upon Mr. Pitfield's conduct, one saying that he had killed Mr. Statham.

Mr. Price: I would not say he has killed him.

A Juror: But the deceased would have been living to-day had the leg been amputated.

Another Juror: It is a case of weak-minded people.

The Coroner: It is a question of pounds, shillings, and pence.

The Foreman: We have the power to stop a great evil.

The Coroner said he thought the case would be echoed throughout the land.

The Foreman said if a man was out of work he could not expect to get it by lying in a field and holding out his arms to pray. The whole business was blasphemous; that was chicanery.

In reply to other questions, Mr. Pitfield said that was the second death he had had.

The Coroner: How many have you cured?—I can't say.

A Juryman thought Mr. Pitfield was responsible for Mr. Statham's death, and asked if something could not be done.

The Coroner replied that as Mr. Statham was an adult he was responsible for his own action. It would be different in a case of children.

The Foreman (hotly): Here is a man who gives treatment which we would not give to a horse or a cow.

Another Juryman suggested the lethal chamber for Christian Scientists, and the Foreman said to Mr. Pitfield, "I pray God you will never cross my doors. If you do you will have to pray God for something."

Another Juryman: You can't educate fools.

The Coroner added that it was just as a juryman had said. It was a question of "plucking pigeons," and that was the top and bottom of it.

The Coroner said the only verdict they could bring was death from septic poisoning, and added that as Mr. Statham acted upon his own responsibility, the jury could not add a rider.

The jury thereupon returned a verdict in accordance with the medical evidence.

LOCUMTENENTS AND AGENTS' FEES.

A CORRESPONDENT writes that some medical agents not only expect extra fees from locumtenents on re-engagements, but also from principals. He states that some time ago he got a locumtenent through a provincial medical agent; and two years later, happening to meet this gentleman while in charge of a neighbour's practice, he requested him when disengaged to come again to him for a week end. A little later he received a demand from these agents for half a guinea. He took no notice till he was summoned in the county court, when he placed the matter in the hands of the Medical Defence Union. After some correspondence he was advised to pay the demand by that society.

*** Our correspondent is to be sympathized with, but it is his own fault that he was liable to this imposition. If he had troubled to read the agent's terms before employing him, by declining to do business under such conditions he would not have subjected himself to such a claim. If medical practitioners enter into such agreements with their eyes open, it is no good complaining afterwards; they must be prepared to abide by the agreement, however unreasonable.

POLICE REGULATIONS AND MEDICAL FEES.

A CORRESPONDENT writes that he was called in recently by the police to attend to a bicycle accident, where two people were injured. His professional services were required by both, and later he received *one* certificate entitling him to a single fee. On complaining to the police authorities he was informed that it was only *one case*—that, therefore, he was only entitled to one fee.

*** It is to be feared that this is in accordance with the general police regulations, although we have been informed that extra certificates are sometimes issued in such cases.

CONTRACT IN RESTRICTION OF PRACTICE.

A CORRESPONDENT sends the following query: A is assistant to B in charge of a branch practice, and signed a bond not to practise within a given radius for a specified time. A resides six miles away from B, but only B's name appears on his doorplate. B has recently died, and A, who is without capital, wishes to put up his own name on the doorplate and carry on practice in this village. He wishes to know: (1) What is A's legal position? (2) What is A's position apart from the legal aspect?

*** (1) This depends on the bond A has signed. If the restrictive covenant was with B only, on B's death he would be freed from the obligation, but it would be otherwise if B's executors and assigns were included in the covenant. (2) Apart from its legal aspect, it could not be regarded as an honourable way of starting a practice, unless the consent of B's executors was first obtained.

Obituary.

ALEXANDER JOHN ALLIOTT, B.A., M D.Cantab., SEVENOAKS.

Dr. Alexander John Alliott, of Sevenoaks, died in September in the town in which he had passed considerably over half of a highly useful existence. A son of a Nonconformist minister in Bedfordshire, well known in his time as a Greek and Hebrew scholar, he received his general education at Bedford Grammar School, which he left as the winner of a scholarship at Pembroke College, Cambridge. There he graduated B.A. in 1870, taking honours in Natural Science, and then entered St. Thomas's Hospital. As a student of the hospital he became M.R.C.S. in 1872, M.B. of his own university a year later, and served a term of office as Resident Accoucheur. Later on he became in turn Resident Clinical Assistant at Bethlem Royal Hospital, and Assistant Medical Officer to the Three Counties Asylum in his old county. To the M.D., Cambridge, he proceeded after he had been some years in practice.

In Sevenoaks he settled down some thirty-five years ago. He soon became a well-known and successful practitioner, and continued to live in the town after his retirement from active practice some two years ago. That event was marked by the presentation to him of a widely supported testimonial in acknowledgement of his services to the locality, and by his appointment as Consultant on the staffs of the Hip Hospital for Children and the Sevenoaks Cottage Hospital. Apart from medical work he had done a good deal for the town in other connexions, being a Church Warden and a member or Vice-President of several local societies. After his retirement he did still more in this direction, and also accepted a seat on the urban district council.

His death is naturally a matter for general regret, for he possessed many points of contact with his fellows, and in addition to being a markedly upright, honourable man, had an attractive and sympathetic personality. He also possessed much musical talent, and was always ready to employ it to the general advantage. As a student he acted as organist in the Chapel of St. Thomas's, and he occasionally played violincello parts at local concerts in Sevenoaks, and was vice-president both of the Musical Union and of the Choral and Orchestral Society. Besides being well known in Kent, Dr. Alliott's name and personality were familiar in medical circles in London, and more particularly among specialists in lunacy. The professional subject in which he took a special interest was diseases of the mind, and at one time he made a practice of receiving resident patients. His skill and success in managing them was well recognized.

Dr. Alliott married in 1875 a lady of Sevenoaks, by whom and by several children he is survived. His funeral, which was attended by a large concourse, bore ample evidence to the high esteem and affection in which he had been held both by his patients, the general public, and by his professional colleagues.

We regret to announce the death of Professor Rudolf Chrobak, of Vienna, which took place on October 1st. The famous gynaecologist was in his 68th year.

We regret also to announce the death of Professor Raymond, of Paris, a recognized authority on nervous diseases. He was in his 69th year.

Just as we go to press comes the news of the death of Professor von Leyden, of Berlin, at the age of 78. His name was known throughout the whole medical world as one of the foremost physicians of his time.

Professor Bombarda, of Lisbon, has, it is stated, been assassinated in his consulting room by a former patient. All who attended the International Medical Congress, of which Dr. Bombarda was General Secretary, will deeply deplore this tragic end of a brilliant career.

A further death to be announced with regret is that of Mr. C. H. Leaf, M.B., B.C.Cantab., F.R.C.S.Eng., Surgeon to the Cancer Hospital, Brompton. It occurred at Eastbourne on October 5th. We hope to publish an obituary notice in a later issue.

Medical News.

The first lecture at the Hunterian Society this winter will be delivered at the London Institute, Finsbury Circus, E.C., on Wednesday, October 12th, at 8.30 p.m., by Dr. H. D. Rolleston, the subject being Acute Arthritis of Doubtful Origin. All members of the medical profession are invited.

The first evening meeting of the present session of the Pharmaceutical Society of Great Britain will be held in the Lecture Theatre, 17, Bloomsbury Square, W.C., on Tuesday, October 11th, at 8 p.m., when Mr. E. W. Lucas, F.I.C., F.C.S., and Mr. F. C. J. Bird will read a paper on The Fixed Oils, Fats, and Waxes of the *British Pharmacopoeia*.

The anniversary lecture of the American Academy of Ophthalmology and Oto-Laryngology was delivered at Cincinnati, Ohio, on September 19th by Mr. Sydney Stephenson, who took as his subject Sloughing Corneae in Infants. Mr. Stephenson was presented by the academy with a suitably-inscribed gold medal.

A course of lectures on Army Sanitation will be given in the Royal Sanitary Institute and Parkes Museum by Lieutenant-Colonel C. H. Melville, M.B., C.M., D.P.H., Professor of Hygiene, Royal Army Medical College. The course will commence on Thursday, October 20th, 1910, at 7 p.m., and will be concluded on November 24th.

A meeting of the Manchester Royal Infirmary Old Residents' Club will be held at the Midland Hotel, Manchester, on Saturday, October 15th, at 6.30 p.m. The meeting will be followed at 7 p.m. by a dinner, at which Mr. Southam will preside. Any old resident who has failed to receive a notice is requested to apply to the secretaries, Royal Infirmary, Manchester.

The next meeting of the Society for the Study of Inebriety will be held in the rooms of the Medical Society of London, 11, Chandos Street, Cavendish Square, W., on Tuesday, October 11th, at 4 p.m., when Mr. John Newton, Secretary of the United Committee for the Prevention of the Demoralization of Native Races by the Liquor Traffic, will open a discussion on "Alcohol and Primitive Races."

The Bradshaw Lecture before the Royal College of Physicians of London will be delivered by Dr. G. Newton Pitt on November 1st, the subject selected being the Results of Bronchial Obstruction. Sir T. Clifford Allbutt, K.C.B., will deliver the FitzPatrick Lectures on Greek medicine in Rome, on November 3rd and 8th, and the Horace Dobell Lecture will be given on November 10th by Dr. W. Bulloch, who has selected as the subject, the Problems of Pulmonary Tuberculosis considered from the Standpoint of Infection. The hour of the lectures is 5 o'clock.

As already stated, the opening address of the winter session at the Central London Throat and Ear Hospital will be given at 4.30 p.m. on Monday, October 17th, by Dr. Purves Stewart. The subject is Certain Intracranial Diseases associated with Nasal, Aural, and Laryngeal Symptoms, and the lecture will be illustrated by lantern slides. The annual dinner of the medical staff of the hospital will take place the same evening at the Trocadero Restaurant, Mr. Stuart-Low in the chair. Past and present students desiring to attend are invited to apply to the secretary.

On September 26th presentations were made to Dr. J. H. Marsh, medical officer of health, Macclesfield, and Mrs. Marsh, in recognition of Dr. Marsh's kindness to many children of Prestbury during a recent epidemic of scarlet fever. The gifts were made all the more gracious by the fact that the idea came from the children themselves. Dr. Marsh was the recipient of a silver-mounted walking stick and leather letter case, and to Mrs. Marsh were given a handsome lady's handbag and a large basket of choice flowers. The silver mount of the walking-stick bears the following inscription: "Presented to Dr. Marsh by the children of Prestbury, 1910."

Evening meetings of the Eugenics Education Society will be held at Denison House, 296, Vauxhall Bridge Road, on Wednesday, October 19th, at 8.30 p.m., when Mr. J. H. Koeppern will read a paper on The Eugenic Value of Maternity Insurance; and on Wednesday, November 16th, 8.30 p.m., when Dr. F. W. Mott, F.R.S., will read a paper on Heredity and Insanity (giving the results of a recent inquiry). On Wednesday, December 14th, at 8.30 p.m., there will be a discussion on The Biological Factor in Infant Mortality. Afternoon meetings will be held in the Caxton Hall, Westminster, on Tuesday, November 1st, at 5.15 p.m., when a paper on Woman's Progress in Relation to Eugenics will be read by Dr. Murray Leslie; and on Tuesday, December 1st, at 5.15 p.m., when Mr. Edgar Schuster, M.A., will read a paper entitled Methods and Results of the Galton Research Laboratory.

Letters, Notes, and Answers.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

LECTURER would be glad to hear of a recent, up-to-date book on medical nursing.

SOUTHAMPTON writes: I should be pleased if any of your readers could tell me the true nature of a tumour of the kidneys, known as hypernephroma, as I am unable to find the term in any modern textbook on surgery. The point I particularly wish to know is: is it malignant or not? Or, if innocent, is it inclined to become malignant if not removed; or, if removed, is there any likelihood of any recurrence of the same kind of growth in any other part of the body?

*** We have referred this question to a surgical authority, who writes: "The word is used glibly enough, and loosely. Some mean by it what the Germans call 'struma suprarenalis,' which refers to a curious tissue of very large, well-nucleated cells having the general arrangement of suprarenal columns, but 'magnified,' as it were. Sometimes these masses exist in otherwise normal adrenal as islands, one or many. Sometimes there is a large tumour mass. Others use the term for the 'renal' tumours of Wolffian, or at least 'nephric' origin, which are found in or on the kidney. They are exceedingly vascular, sometimes villoid, with cells and structure such as are found in endotheliomata. Some of these are found *post mortem* in those dead of other causes, sometimes they are removed surgically as 'renal' tumours, being within the capsule and sometimes invading the renal tissue proper, sometimes encapsuled within the kidney. It is not possible, therefore, to say definitely that they are 'malignant.' When recognized clinically they are removed as malignant tumours, for they generally are so when growing rapidly, but the malignancy is relative. I removed a large one some three or four years ago, and the man has not yet had any recurrence. I believe recurrence is generally local by direct extension, but some, at least, give rises to numerous metastases, especially, I think, in children."

SOUR MILK TREATMENT.

NAVY writes: Could you give me any advice on the following points: (1) What is the best literature to be obtained about the sour milk treatment and dieting? (2) Is a special diet necessary while taking sour milk? (3) Is this dieting (sour milk) of any value in obscure rheumatic (?) pains probably due to gastro-intestinal disorder?

*** (1) We may refer our correspondent to the discussion which took place at the Therapeutical and Pharmacological Section of the Royal Society of Medicine last winter, published in the *Proceedings of the Royal Society of Medicine*, Vol. iii, No. 3, January, 1910, and to the discussion in the Section of Pharmacology and Therapeutics at the recent annual meeting of the British Medical Association; a brief notice of the latter was published in the BRITISH MEDICAL JOURNAL of July 30th, 1910, p. 289, and a full report will be published shortly. There is a book on the sour milk treatment, *Soured Milk and Pure Cultures of Lactic Acid Bacilli in the Treatment of Disease*, by Dr. G. Herschell (London: H. J. Glaisher. 1909. 2s. 6d.) (2) No special diet is necessary whilst taking sour milk, but it is advisable to reduce the amount of meat taken. (3) Opinions on this point differ. Some allege that sour milk may aggravate chronic rheumatism; others have found benefit from it in cases due to gastro-intestinal fermentation. It is worth trying.

ANSWERS.

F. H. S. G.—For the examination in physiology for the Fellowship of the Royal College of Surgeons in Ireland, any standard textbook on the subject is suitable. Halliburton's *Handbook of Physiology* (John Murray and Co., London) or Howell's *Textbook of Physiology* are those most frequently read.

"HATTON" will probably find any of the following works suit his purpose: (1) G. H. Stout, *The Groundwork of Psychology*, London, 1903; (2) E. B. Titchener, *A Textbook of Psychology*, 1909; (3) W. James, *The Principles of Psychology*; (4) H. Münsterberg, *Grundzüge der Psychologie:* (5) W. Wundt, *Grundzüge der Psychologie;* (6) H. Ebbinghaus, *Grundzüge der Psychologie.*

DESTRUCTION OF FLEAS.

DR. G. H. MAPLETON (Goudhurst) writes: "M.D." will find powdered pyrethrum roseum an excellent thing to keep fleas away. I should advise him to sprinkle a very little on the upper parts of his socks, and also on his sheets.

SEA SICKNESS.

DR. F. DE HAVILLAND HALL writes: In answer to "Mer," I would say that I have had most excellent results in a large number of cases from the administration of chloretone, 5 grains in capsules, one capsule to be taken every three hours for three doses, so arranged that the last dose shall be taken on going on board. This usually suffices for crossing the Channel; for longer voyages more doses may be necessary. I have never seen any ill effects from the drug.

C. K. B. writes: In reply to "Mer's" query in this week's BRITISH MEDICAL JOURNAL, I can strongly recommend capsules chloretone gr.v, and tabloid tri-bromides effervescent (Burroughs, Wellcome, and Co.) I was surgeon on the R.M.S. *Port Kingston* to Jamaica and back, and found the combination most useful. The tabloid must be powdered, then added to half tumbler of water, and taken at the same time as the chloretone. The dose may be repeated every three or four hours if necessary.

PAPAGEI writes: In reply to "Mer's" query in the JOURNAL of October 1st, I can strongly recommend chloretone (tri-chlor-tertiary-butyl alcohol) from personal experience of its use, when I get a chance, which unfortunately is not often, as I live in an inland county. I indulge in sea-fishing from a boat, and from a fairly large experience on the sea in various craft, I think there is nothing more trying than being seated in a small anchored boat in a choppy sea for several hours; formerly I used to take potass. brom. half a drachm in soda-water before starting, but I find by taking a 5-grain capsule of chloretone (P. D. and Co.) about half an hour before starting, and another on getting into the boat, that I do not feel at all ill, and can eat and smoke in comfort.

DR. OLIVER CARLYLE (Liverpool) writes: Probably "Mer" will get the best results from bromides and chloretone, commencing administration a couple of days before the voyage, and restricting the diet, giving a purgative the night before embarking, using an abdominal binder, and, if necessary, a vaso-constrictor. The list of drugs recommended includes:—Gastric sedatives: Minute doses of iodine tincture, carbolic acid, creosote, menthol, hydrocyanic acid, resorcin, various bismuth preparations. General sedatives: Bromides, bromidia, hydrobromic acid, etc.; chloral hydrate, chloralamide, chloretone, chlorobrom, chloroform, and its compound tincture; phenacetin, phenazonum, orexin tannate, morphine, and other opium preparations. Stimulants: Strychnine, brandy, etc. Others, acting on the various theories, give atropine to dilate one or both pupils; jaborandi and pilocarpin nitrate; (?) quinine to act on the semi-circular canals. Vaso-dilators: Amyl nitrite, sodium nitrite, etc. Vaso-constrictors: Digitalis, adrenalin, epinephrin, pituitary extract. Smelling salts, blisters on the mastoid or epigastrium, etc.

TURTLE BACK writes: "Mer" will find hyoscine hydrobrom. $\frac{1}{200}$ grain by the mouth or otherwise a capital preventive of sea sickness. Large doses of bromide thrice daily for two days before sailing have also proved useful.

ATMOSPHERE OF ENGLISH COAST TOWNS.

ALPHA writes: For the information he requires, I should advise "Omega" to apply to the Meteorological Office, Victoria Street, S.W.

HOME FOR SANE EPILEPTIC WOMEN.

T. W. H.—Application might be made to the following institutions: (1) The National Society for Epileptics, Secretary, G. Penn Gaskell, Esq., Denison House, Vauxhall Bridge Road, S.W. (2) The David Lewis Epileptic Colony, Sandlebridge, Knutsford, Cheshire; Secretary, E. W. Marshall, Esq., 38, Burton Arcade, Manchester. (3) Meath Home for Epileptics, Godalming; apply to the Lady Superintendent. (4) St. Luke's Home, 36, Parkwood Road, Bournemouth East (for Epileptic Churchwomen); apply to the Deaconess in Charge.

ERYTHEMA MULTIFORME.

DR. H. J. THORP (Ipswich) writes: In reply to "X." (BRITISH MEDICAL JOURNAL, September 17th, p. 827), erythema multiforme has a great tendency to get well without treatment. The following I can recommend: Calamine lotion with liq. carb. detergens, rest in bed to ensure complete protection from alteration of temperature, diet of the plainest character. Salicine or salol if there is rheumatic diathesis.

WEST COAST OF AFRICA.

CLYDE.—The West Coast of Africa cannot, even at the present day, be looked upon as a health resort, but the description of conditions in 1897 referred to by our correspondent no longer applies now. With improvements in sanitation, especially mosquito sanitation, conditions are steadily becoming better, and many people go out and do fairly well there. Climate, however, apart from disease, plays a very important part in West African life, and this necessitates a leave home after every year's work. Quinine prophylaxis has greatly reduced malaria, but blackwater fever is still fairly prevalent in some parts of the Coast, The hinterlands of Nigeria, Sierra Leone, and the Gold Coast are, on the whole, healthier than the coast lines. The climate of West Africa is worse than that of the Malay Peninsula. People can stay out in the latter place for much longer periods of time than in the former, and can do so without any serious detriment to their health. If an appointment can be obtained in the East it is preferable to one in West Africa.

TREATMENT OF INFLAMED ARM AFTER VACCINATION.

DR. H. J. THORP (Ipswich) writes: I have for very many years used the following antiseptic paint: Liq. fer. perchlor. fort., ac. carbol., sp. terebinth., āā 3j; glycerine 3ij. It is also an infallible application for septic wounds generally; if the wound is very acutely inflamed I usually encircle it instead of applying the paint directly to the wound; it is well to apply it to the neighbouring glands besides.

PATHOLOGY OF ALOPECIA AREATA.

STAFF SURGEON.—Views as to the etiology of alopecia areata are still divided. There are partisans in the nervous camp, and others in the parasitic one. On the whole, the swing of the pendulum appears to be in favour of the "*nervous*" view. Jacquet, of Paris, strongly supports his "dental" origin of alopecia areata, and brings forward much evidence in its favour. His minute analysis of the *parasitic* (and epidemic) position is very destructive. In conclusion, the essential etiological factor (or, perhaps, factus) is still *sub judice*. We would suggest that "Staff Surgeon" ought to publish his experiences which lead him to conclude the disease is contagious.

ANTITYPHOID INOCULATION.

AGMONO.—In view of the great prevalence of enteric fever in India, a large number of persons elect to submit to a preventive inoculation before going out. There is a vast amount of data which goes to show that antityphoid inoculations reduce both case incidence and case mortality. In reply to the first question, it may therefore be said that it is advisable for a European travelling to the East to a district where enteric fever is rife to be inoculated before departure. In reply to the second question—namely, where the material can be obtained, what apparatus is required, and how many inoculations are necessary—it may be pointed out that in this country Wright's vaccine is employed, while in Germany, Pfeiffer and Kolle's vaccine is preferred. In the former case the vaccine prepared by the Lister Institute of Preventive Medicine can be obtained from Messrs. Allen and Hanburys, while other well-known firms—for example, Messrs. Burroughs, Wellcome, and Co.—also produce and sell typhoid vaccines. The apparatus required is a good sterilizable hypodermic syringe. According to Wright, two injections should be given with an interval of from one to two weeks, 750 to 1,000 million bacilli being injected at the first, and from 1,500 to 2,000 million at the second, injection. In reply to the third question, there is no reason to believe that antityphoid inoculation will in any way interfere with antivariola vaccination. Lastly, it is preferable to perform the first injection at least before the person starts, so that the malaise which follows this may have passed off before going on board ship. Many give both doses beforehand. The prevention is believed to last from eighteen months to two years, and for this reason there is no advantage to wait until the person has arrived, while the advantage of having the inoculation performed before starting is that the negative stage will have passed before arrival, and the protection will be fully developed.

TREATMENT OF GRAVES'S DISEASE.

DR. F. C. MCNALTY (Winchester) writes: I see in the discussion following Professor Kocher's paper on the surgical treatment of Graves's disease not a few physicians advocate medical treatment. I wish to say that I have found the continuous application of elastic bandages a very useful adjunct. I generally use a cold-water pad on the thyroid gland, over it an elastic bandage. It is wonderful the amount of pressure (after a while) that is borne without inconvenience, and the result is undoubtedly good.

DRAINAGE OF BLADDER FOR ENLARGED PROSTATE.

DR. GEOFFREY R. WILSON (Chipping Ongar) writes: In reply to "Bahia's" query in the current number of the BRITISH MEDICAL JOURNAL, I would like to recommend the practice of suprapubic cystotomy and the permanent drainage of the bladder subsequently by means of Buckston Browne's suprapubic drainage apparatus. I have a patient, aged 72, who has been treated in this way since April last with excellent results. His bladder has remained perfectly comfortable, and his nights are undisturbed. The use of this apparatus does away with the necessity for cumbersome dressings and all unpleasant urinous odours. The bladder is irrigated daily, and from time to time the apparatus is removed and thoroughly cleansed, and replaced without difficulty or pain. In this case the use of the catheter was prohibited by the tenderness and congestion of the urethra, and prostatectomy was considered too hazardous on account of the patient's general condition. This method of dealing with such cases is perfectly easy and simple to use, and involves no great surgical skill.

LETTERS, NOTES, ETC.

A GRAND prize has been conferred upon Messrs. Burroughs, Wellcome, and Co. for their exhibit at the International Hygienic Exhibition now being held in Buenos Aires.

HYDATID DISEASE OF LIVER.

DR. J. REID (London) writes: In the JOURNAL of October 1st, p. 957, there is an article by Dr. Maclaurin on hydatid of the liver. Has he any experimental proof of the reproduction of an echinococcus from an echinococcus? One used to see echinococci spit up frequently, but *not* reinfection. Negative proof counts for little; but a deviation of the *cyclical* history of a taenia ought to be well authenticated.

TRAMWAYS.

LONDON writes: The London trams have so many points of excellence that I hesitate to criticize. Still, I heartily agree with your remarks. The outside or top of the tram is highly dangerous to health on account of the extreme draught. I have heard many complaints of this nature. Seats that close up with a spring would avoid wet sitting accommodation after rains. Lastly, I think all screws should be flat-headed and countersunk—that is, flush with the seats, and not projecting, to tear and wear clothes. Otherwise, I think the trams admirable.

A DISCLAIMER.

DR. HECTOR MUNRO (Welbeck Street, W.) writes: In the *Daily News* of last Thursday an interview with me is reported on the effects of systematic fasting. In publishing this a mistake has been made, and I write to express my sincere regret. An article appeared in the *Daily News* some weeks ago describing a fast cure undertaken by the writer. He mentioned certain very interesting facts, and suggested that a committee of medical men watch a number of selected cases and report. Now, I am much interested, having had 18 such cases during the last two and a half years, and so I got in touch with the writer of the article. Last Wednesday a gentleman called on me from the *Daily News* by appointment, and I understood that it was to have been a talk preliminary to the formation of this committee of inquiry. I greatly regret my carelessness in not stating the terms of the interview quite clearly, and I am sure that the fault is entirely mine.

THE "DENTISTS' REGISTER."

MR. FREDERICK SMALL (Hackney) writes: In the year 1878 my name was duly placed upon the *Dentists' Register*. For the past twenty-five years I have practised as a dentist at the above address. My attention was recently called to the fact that my name did not appear in the *Register*, and I at once put myself into communication with the Registrar, with the result that it was discovered that my name had been inadvertently omitted from the *Register*. The Registrar at once rectified the omission, and I hold his certificate, dated September 21st, 1910, of restoration of my name to the *Dentists' Register*. As the omission has been very detrimental to me in my practice, I shall esteem it a favour if you will help me to put the matter right by kindly inserting a suitable paragraph in the JOURNAL as to the omission from and the restoration of my name to the *Register*.

POTATO CHEESE.

DR. C. H. FOLEY (Ardrahan) writes: I wish to bring to the notice of your readers who may be advocates of the sour milk treatment the following preparation, which I first became acquainted with by reading in the *Monthly Gazette of Practical Medicine* (for February, 1831). Taken with water or milk, in its results it is as satisfactory, while easier to take, than soured milk obtained naturally or prepared:

"In Thuringia and part of Saxony a kind of potato cheese, made in the following manner, is generally preferred to that obtained from milk:—Boil good mealy potatoes, and when cold peel and reduce them to a uniform pulp with a rasp or mortar. To 5 lb. add a pint of sour milk and the requisite portion of salt; knead the whole well, cover it, and let it remain three or four days, according to the season; then reknead it, and place the cheeses in small baskets, that the superfluous moisture may run off; then dry them in the shade, and place them in layers in large pots or kegs for a fortnight. The flavour is improved by age. This cheese has the advantage of never engendering worms, and of keeping in good state for many years in a dry place and in well closed vessels. The addition of potato pulp would, no doubt, render the butter-whey cheese used in many parts of this country more easy of digestion."

In reality this is a culture of the lactic acid bacillus on a nutrient of potato mash, first sterilized by the boiling. Added to milk heated to 10° C. the "cheese" soon produces a characteristic acidity.

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